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UPS WEB/SNMP MANAGER

CS121 Series

User Manual – English

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English Manual

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1. The CS121 family - Introduction

1.1 About your CS121

1.1.1 General information

The CS121-series are a group of products designed especially for critical resource management within technical facilities. The CS121 can act as a **UPS (uninterruptible power supply)** manager for all other computers in the network. All of these products share many of the same basic CS121 features, and some have special components and functions. The CS121 products are most commonly used for the management of UPS systems, so in this manual we specially reflect to the usage of such devices with your CS121. All of the basic features and most of the product specific features and operation are explained in this manual. This manual is the basis also for other CS121 based products like CS121, CS121BUDGET, SENSORMANAGER, SM_T_COM, SITEMANAGER, SITEMONITOR, SITESWITCH4 und RASMANAGER.

Note: When using the CS121 to act as a UPS (uninterruptible power supply) manager for other computers in a network it is necessary for those computers that are being managed by the CS121 to have its own RCCMD installation. RCCMD is the only possibility for enabling the communication between the CS121 acting as a UPS-Manager and other client computers in a network. While it is possible to add the different computers as clients in the CS121 settings it is only possible for those computers to act as an RCCMD client when they are running RCCMD. Each computer running RCCMD must have its own RCCMD license. This is the only possibility for the CS121 to fulfil its function as a network UPS (uninterruptible power supply) manager. Setting up the RCCMD commands is described in depth in the sections 2.3.2 Quickguide to install an RCCMD-job and 5 Additional Software.

There are several CS121 SNMP-adapters available for different UPS and although they are mainly made for UPS, the adapters can easily be modified by simply plugging in other products like the SITESWITCH SS4-AUX, SENSORMANAGER, and Modems in order to add new features.

There are two basic types of CS121-adapters: external and slot cards. The basic versions for UPS come without MODBUS-protocol, COM2 for environmental sensors and manageability and AUX for dry-contacts alarms. For more differences please see section 1.4 Comparison. There are other external products based on the CS121 such as the RASMANAGER, which is a CS121 with a built-in modem. Other external devices include the SiteSwitch 4 (for the direct control over power sockets), the SITEMONITOR 64 (for monitoring up to 64 digital alarms), and the SITEMANAGER 2 (a device with multiple functions) which are used for handling facility management purposes that go beyond the UPS systems.

Generally, the SNMP adapter runs an embedded Simple Network Management Protocol (SNMP) software agent. This agent responds to the SNMP operations “gets” and “sets” and also forwards “trap-messages” to designated recipients when critical conditions occur to the UPS - such as low battery status. Additionally, the adapter can send RCCMD signals to client computers running the Remote Console Command (RCCMD) initiating automatic shutdowns or other actions in case of an extended powerfail. (The RCCMD client is an extra system module requiring its own license.)

1.1.2 Functionalities of your CS121

- **SNMP Adapter CS121/CS121 Slot**: The SNMP adapter is a compact unit requiring minimal workspace (ca. 28x69x126 mm for the external adapter CS121L). The slot card versions of the adapter (CS111 and CS121SC) get inserted into the extension slots of UPS models supporting its card type.

- **Serial Port:** Two DIP-switches change the adapter's serial port (COM2) to a configuration port for installation or to a communication port for environmental sensors, modem or other

functions. The MODBUS-version uses the COM2 as RS485 and is not available for configuration. The MODBUS version can be configured only via Webbrowser, Telnet and Default IP address.

- **SNMP-Traps for remote monitoring and pre-alarming:** The main function of the SNMP-adapter lays in the transmission of alarm conditions of the UPS to the monitoring station (SNMP traps and RCCMD traps/commands). It also makes UPS data access able for users in the network upon request. With this function it is possible to retrieve and monitor eg. battery capacity of an UPS from an SNMP management station. The event settings configuration menu also allows for SNMP trap testing.

- **Remote Control:** With this function it is possible to switch the UPS to Bypass (depending on the model) or start battery tests. This remote command is executed either via the Network Management Station or the UPS Management Software or any Webbrowser.

- **Telnet:** Every Adapter maybe reconfigured via the network, using Telnet or http after the initial configuration of an IP Address for the adapter. Current UPS data can also be shown using Telnet. Generally we recommend to use the Webinterface since Telnet (and terminalconfiguration) does only allow to setup a basic configuration of the CS121.

- **Works with all major NMS:** The SNMP adapter works with most, widely used Network Management Systems e.g. HP Open View HP UNIX and Microsoft Windows NT, Novell NMS, Spectrum, Sun NetManager, IBM Net View/600 and others. All SNMP systems which either allow the compilation of the MIB or already incorporate MIB RFC 1628 for UPS Systems, can be operated with the Cs121.

- **Multiserver shut down via RCCMD/RCCMD2 compatibility:** The SNMP adapter CS121 is able to initiate a network shutdown with any RCCMD modules from the UPS-Management Software CD. A TCP/IP based RCCMD signal is sent to all RCCMD clients in the network. This enables the remote shutdown of practically an unlimited number of client computers, independent of which operating systems the clients are running. RCCMD is an optional part of the UPS-Management Software. Your UPS dealer is able to provide you with Licensekeys for the RCCMD. The UPSMAN service of the UPS-Management Software suite is an optional module and not needed for that basic CS121 operations. We recommend to use the UPSMAN service only if the UPS is connected via serial or USB cable, if a CS121 is connected only the UPSMON (optional OEm designed Windows interface) and the Webbrowser are needed.

- **RS-232 UPS Protocol Router – Pipe- through:** The CS121 (not BUDGET versions) is able to transfer the UPS RS-232 protocol on COM1 directly to COM2. This allows the use of additional monitoring software on COM2 while making extra hardware (RS-232 multiplexer) to multiply the UPS comport unnecessary.

- **Logfile:** CS121 has an internal logfile synchronized with either a set timeserver in your network or from timeservers in the internet. This logfile can be accessed through the Webbrowser, UPSMON, JAVAMON or via FTP. Due to the maximum file size of 250 lines (depends on Hardware, newer HW131 have 2-3 more space), old entries are deleted automatically.

- **Network settings:** The CS121 Models are adjustable to the network environment. An auto-sensing function 10 or 100Mbit can be activated.

Note: In large fast networks as is normally the case by CISCO or HP-Procurve with auto-sensing switches problems can occur during the reboot of the CS121. If this is the case and switches are being used then the auto-sensing function might very well be the problem. Because the CS121 is per default set to auto-sensing (ON), this can lead to the network devices not being able to harmonise communication rates with one another. This auto-sensing process can take a long time and is sometimes never attainable. This taxes the CPU capacities of the switches and can greatly slow down the network or even lead ultimately to its failure. In this case a default network speed should be determined

and set after which, the CS121 can be changed from AUTO to the given speed, "100half" for example.

- **Email client:** The CS121 adapters incorporate a built-in SMTP email-client, which is able to send emails automatically in the event of an alarm.

- **Web server:** The CS121 Models contain a web-server, which displays all functions and settings of the adapter. Non-Windows users may use the JAVAMON as graphically display for UPS data (The JAVAMON module is not implemented in all versions.). Generally the CS121 Webserver is designed for the use with MICROSOFT INTERNET EXPLORER 6 with Active X and is recommended as configuration and management interface.

1.2 About the communication with the CS121-Adapter

- **MODBUS**

Modbus is the de facto standard protocol in industry which is used in the building surveillance and facility management. All CS121 types include an MODBUS over IP interface and MODBUS over RS232. The CS121 MODBUS types do not have an RS232 interface at COM2, here they use an RS485 interface. The CS121 BUDGET series does not support MODBUS. Please see the appendix where also output and protocol interface are shown.

- **SNMP**

The SNMP (Simple Network Management Protocol) is the Internet-standard protocol for managing devices on IP networks and is defined and standardized in Requests for Comments (RFCs)-specifications. UPS systems are using in generally as Management Information Base (MIB) the RFC1628-specification which defines UPS-specific devices.

The CS121 also comes with the standard MIB RFC1628. Because of this MIB is already part of most SNMP software products, it is not required to compile the MIB (Please search the MIB2 directory tree for a “UPS-MIB”). If you want to include your CS121-adapter to an SNMP-Management station, which does not have the standard MIB RFC1628, you can download the specific MIB from our website. (http://www.generex.de/e/download/cs12x/download_p.html) Copy the MIB file to the appropriate MIB-directory of your SNMP-station and compile this file. In most cases your SNMP already has implemented this MIB and a compilation is only necessary if you want to read extra information than just UPS (e.g. for SENSORMANAGER, etc.)

For additional information about MIB and NMS see also the section “UNMS” later on in this manual.

For the CS121-SNMP MIB Implementation, please refer to the GENEREX download-page http://www.generex.de/e/download/cs12x/download_p.html

This MIB is specially designed for the CS121 and includes SNMP values for all CS121 optional products (Temperature, humidity, alarm contacts, etc.) Basicly this RFC1628CS121.MIB is the original UPS MIB, extended by extra values supported from your CS121.

- **TCP**

Most common way to communicate with the CS121-adapter is over TCP. CS121 includes UPSTCP, with gives you a complete interface to integrate the adapter into your network.

1.3 The CS121 Adapter Package

The standard CS121-adapter package contains an SNMP-adapter unit with supporting hardware and software. (Note, that the Budget-models do not have all features.)

Optional is a mounting kit for wall and DIN Rail mounting.

Product	Included in delivery
CS121L (Extern)	Power supply external. (For USA/CA UL: Supplied by NEC Class 2 Power supply only) User manual English. Configuration cable for serial port configuration via Terminalsoftware - and for connection of optional devices for your CS121.

CS121SC (Slot Chinese)	User manual English. Configuration cable for serial port configuration via Terminal software - and for connection of optional devices for your CS121.
CS121F (Slot FUJI)	User manual English. Configurationcable for serial port configuration via Terminalsoftware - and for connection of optional devices for your CS121.
CS121R (Slot RIELLO/AROS)	User manual English. Configurationcable for serial port configuration via Terminalsoftware - and for connection of optional devices for your CS121.
CS121MOD (Extern)	Power supply external. (For USA/CA UL: Supplied by NEC Class 2 Power supply only) User manual English. Configuration cable for serial port configuration via Terminal software - and for connection of optional devices for your CS121. Mini-8 connector for your MODBUS RS-485 connection via COM2.
CS121BL (Budget Extern)	Power supply external. (For USA/CA UL: Supplied by NEC Class 2 Power supply only) User manual English. (Configuration only via networkcable)
CS121BSC (Budget Slot Chinese)	User manual English. (Configuration only via network cable)

1.4 Comparison

CS121 MODELS	FEATURES and OPTIONS	Supported UPS models	CS121 COMMON FEATURES FOR ALL MODELS *
CS121L external	Second mini din 9 COM port for RS232. AUX port for digital input/ output. MODBUS RS485 option. Remote RAS management options.	All 1400 UPS models from over 60 different UPS manu-facturers.	All CS121 devices are capable of managing the UPS models for which they are compatible via the UPS's native serial protocol. Each CS121 integrates seamlessly into all contemporary SNMP facility management systems. All CS121 models have their own web server with configurable event management for automating responses to power and UPS status conditions. This includes Emails transmission, RCCMD net work messages and shutdowns, logfile entries, grafical logfile for statistics, RCCMD Traps, UPS shutdown functions and wake-up calls for computers which have been shutdowned before (wake-on-lan). All actions and events may be configured individually. All CS121 have a built-in scheduler for regular tasks like battery tests, battery calibration and UPS shutdown/restore. All CS121 have a wide range of network management features for alarming users and managing other SNMP devices and general overall Computer and Power resource management via RCCMD. All CS121s (except BUDGET models) include MODBUS-over-IP and an optional MODEM interface. All CS121s (except BUDGET models) offer a COM2 for connecting environmental sensors or for connecting other products and software to manage the UPS. All CS121 have 2 years warranty and a free update period of 3 years. All CS121 are made in Germany.
CS121SC slot	Like CS121 L external.	All Chinese/ Taiwanese standard slot UPS models.	
CS121F FUJI slot	Second mini din 9 COM port for RS232. AUX port for digital input/ output. Remote RAS management options.	FUJI UPS	
CS121R Riello slot	Like CS121 F.	Riello and Aros UPS	
CS121BL BUDGET external	Economic CS121 with LAN UPS management only. (No MODBUS over IP, no AUX port for dry contacts, no COM2 interface for modem or environmental sensors.	All 1400 UPS models from over 50 different manufacturer.	
CS121BSC BUDGET slot	Like CS121 BUDGET External	All Chinese/ Taiwanese standard slot UPS models.	

1.5 CS121 overview

For CS121L, C and Slot card types

No.	Description
(1)	Network connection RJ45 10/100 Base T Connector (with Status LED, green=link, yellow=activity)
(2)	Serial com-port (COM2) for configuration or connection of optional devices. (not BUDGET versions)
(3)	Error/Link LED UPS Status (Red=boot or error, Green (flashing) = normal
(4)	AUX Input/Output for dry contact alarms and relays
(5)	DIP-Switches for configuration mode
(6)	Serial port (COM1) for UPS connection (at BUDGET for terminal configuration)
(7)	(12V) DC Connection (Outside US : 9V-30V)

Figure 1: Connectors of the CS121

CS121 family:

CS121L = external device with external power supply 9V (US: 12V)
CS121SC = slot device for Chinese UPS with slot (also as BUDGET, CS121BSC).
CS121F = slot device for FUJI UPS Japan
CS121R = slot device for RIELLO/AROS UPS Italy
CS121MOD = external device with MODBUS RS485 port
CS121CS MOD= slot device with MODBUS RS485 port
CS121BL = external device BUDGET-Model (does not have COM2- and AUX-port)
CS121BSC = slot device BUDGET-Model (does not have COM2- and AUX-port)

- **(1) LED-Status of Network connectivity**: The LEDs which are integrated into the RJ45 connector (see No. 1 in the figure above) will signal with green a connection to the network and with yellow network communication.

Green LED	Red LED	Adapter
OFF	ON	Adapter is looking for UPS/initializing. The start phase can take up to 2 minutes
Flashing	OFF	Data flow/normal mode of the UPS
ON	ON	Communication to UPS interrupted

- **(2) LED-Status of the CS121 HW131**: The following table is valid for the CS121 HW131 only.

Operating Condition CS121 HW 131	**LED-Signaling**
Start procedure 1, unpacking of the OS	red flashing
Start procedure 2, reboot of the OS	red long on
If the red and green LED shine at your CS121 HW131 during the reboot, huge broadcast traffic into your network is present „recieve buffer overflow“. The green LED is signalizing at the reboot, that the „traffic buffer“ is full. Advice: You should filter	red AND green during reboot

broadcasts via your switch, because it comes to performance losing of the CS121 HW131 unnecessary.	
Normal condition	green flashing
UPS communication lost	red constantly

- **(3) DIP-Switches**: The DIP-Switches differentiate between two functions: Configuration- and normal mode.

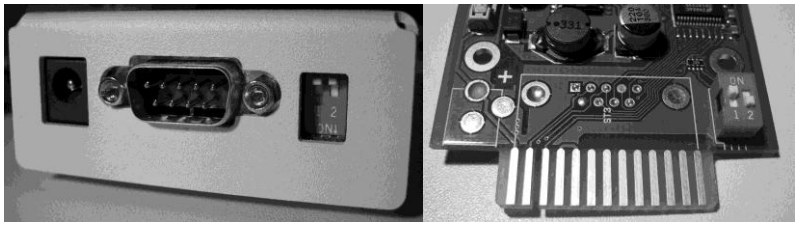


Figure 2: DIP-Switches: CS121L (left) in configuration mode (IP 10.10.10.10) and CS121SC (right) in normal mode

Switch 1	Switch 2	Description
ON	OFF	Normal operation, device runs on the configured IP-address
OFF	OFF	Configuration mode with default IP Address 10.10.10.10 and active COM 2 configuration for Terminal SW

Note: In the configuration-mode the full functionality of the CS121 is not provided! Please change to a valid network address and put DIP-switch 1 to position ON as soon as you made your basic network setting! After this, please continue configuring your CS121 in your network. Please follow up the procedure in chapter 2 Quickstart in this manual.

Additional information for CS121BL/CS121BSC: The BUDGET-versions do not have an external connection for COM2. This configuration interface has been routed to COM1 (UPS port).

- **(4) Power supply**: A power supply adapter (wall socket unit) (DC, 12V) provides power for the Adapter (external Model CS121L, CS121MOD, CS121BL only).

Note: If you are using a different power supply unit from the one in the adapter package, please consider that the polarity is set correctly. The adapter might be damaged if the wrong polarity is used. The power supply voltage should be at least 9V, 12 V is recommended.
For the CS121SC models C and the slot card, there are no power supply units. These units will receive power directly from the UPS device. The SNMP adapter C and slot card both incorporate a variable 9-36V input.

UPS Interface cable (extern devices only): Please use the manufacturer's serial port cable that came with your UPS to connect the UPS with the SNMP-adapter. Please contact your UPS manufacturer, if you have questions. **Only use the original RS-232 UPS cable for communication, which was provided with the UPS.** If your UPS has a contact closure port, please use the manufacturer's special cable. Please consult your UPS dealer on information regarding special cables.

1.6 A typical installation - CS121 in a network environment

A typical installation on the SNMP-adapter monitoring a UPS in an Ethernet network follows in the illustration below. The SNMP-adapter communicates with the UPS to inform you about your systems power condition.

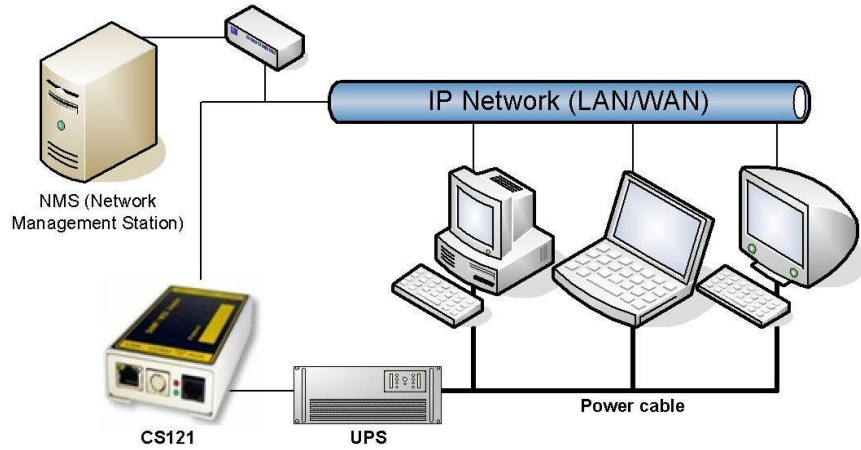


Figure 3: CS121 in a network environment

1.7 Connect your CS121 ...

In generally you can choose between 3 ways to configure the CS121-adapter:

- By using the serial port you can make the configuration via a Terminalprogram such as e.g. Microsoft-HyperTerminal. This configuration-mode allows you to make the fundamental settings for network connectivity and for defining the event and action-settings.

By using a LAN-connection you can make the configuration via Telnet or Webbrowser:

- The configuration via Telnet supports the same interface as the configuration via Terminalprogram.
- The configuration via Webbrowser allows you to make all kind of settings and configurations. If you have any possibility, we recommend you to configure the CS121-adapter via this way.

Note: External versions: At the CS121BL in configuration-mode a zero-modem cable (not included) may be connected to COM1. Please use a Terminal program to configure your CS121 via this connection. Option: At UPS with a DIP-Switch to configure between the UPS built-in serial port and outside serial port (e.g. UPS from PHOENIX TEC) you may insert the CS121BSC into the slot and use the original UPS cable for configuration via Terminal. We recommend to use the webbrowser as configuration interface.

1.7.1 ... via serial port

The SNMP adapter incorporates two serial ports (not BL and BSC-versions), whereas COM1 (see figure “Connectors of the CS121” above) provides the connection to the UPS and COM2 is used to configure the SNMP-adapter.

CS121BSC:

At the CS121BSC in configuration mode you can use the original UPS serial cable of the UPS and the in-built RS232 UPS interface to connect your CS121BSC via a Terminalprogram.

For the CS121BSC exists also the possibility to make the configuration via COM1. Therefore you have to set DIP-switch 1 in Position OFF and connect to COM1 port to the serial port of your workstation.

CS121 MINI/CS121 R_II:

It is required, that the DIP Switch 2 remains in position OFF, otherwise the device will not start (valid for CS121Minislot/CS125/CS121R_II built 2008- 2010 from serial number 0123M-0001 to 0123M-1135).

Configuration cable (not CS121BL/BSC):

Your package contains a configuration cable, which connects to the serial port (COM2) of the SNMP-adapter and the serial port of a PC with terminal software. It is sufficient to use a Dumb-Terminal or Terminal-Emulationprogram, such as e.g. Microsoft-HyperTerminal. During the configuration of the SNMP adapter please ensure that the DIP switches are in the correct position. Please also refer to the section 1.5 CS121 overview in this manual.

1.7.2 ... via LAN

Connect the CS121 with RJ45 cable (not included) to your LAN.

1.8 Verifying the CS121 connectivity

After the CS121-adapter is connected to the UPS and to the Computer via serial port or via LAN, please verify the connectivity before you start to configure the CS121. The setup system can be checked before and after a configuration using the following 3 steps:

- **UPS-Status displays (LEDs)**

During the boot-procedure, the red LED is on, whereas the green LED is off. (Models with Hardware Version131 do also indicate uncompressing the firmware files with flashing red LED lightening) The boot process can take up to 3 minutes. If there is an error, the red LED does not go out. For more detailed information about the UPS-Status LEDs, please see section 1.5 CS121 overview.

After five to ten seconds after the boot-process, the green LED flashes rapidly; this indicates that the SNMP-adapter is trying to start the communication. The adapter will indicate its communication accessibility with random green LED flashes.

- **Network status LEDs**

The LEDs, integrated into the LAN-Connector (RJ45-), will signal a connection to the network with green and with yellow network connectivity.

- **Ping the SNMP-Adapter**

Perform a PING-command from the SNMP-station or from another computer in your network resp. NMS (Network Management Station).

If you do not get a response, check the SNMP-adapter network connection and IP-address of the SNMP adapter. The IP-address of the adapter is set to 10.10.10.10 if DIP-switch 1 is in position OFF (configuration-mode).

Note: The different response rates during the ping process do not correspond to an error. The adapter does not answer every ping signal at the same speed, due to different sized UPS protocols. If UPS protocols are of extensive size a timeout can occur briefly. A permanent timeout however is an error.

2. Quickstart

The Quickstart manual gives you a short instruction into the main features and how to make some basic settings and guides you in connecting the SNMP-adapter to the network and UPS.

Note: Before you start to configure the CS121 please ensure that your connections are valid as described in section 1.8 Verifying the CS121 connectivity (Red network-LED off; green network-LED flashing in intervals). Please take care that your UPS has been correctly installed before and is running!

There are three methods available for configuring the SNMP-adapter: Telnet, terminal and HTTP. These methods differ in the type of user interface and in the type of connection to be used for the configuration. The telnet method shares similarities with both, the terminal and the HTTP-method. Like the HTTP-method, the telnet method uses a network connection via the IP-address to establish a communication, but it has the same type of user interface as used in the terminal-method. The terminal-method requires that the SNMP-adapter be connected via the serial cable to a host computer. The terminal and telnet methods provide the user with a text menu indicating per alpha-numeric keys the possibilities for the user to either enter configuration commands or navigate through the menu levels. The HTTP-method provides the user with forms in which the system settings are either typed directly into a form or chosen per drop down menu.

Although, all of the configuration possibilities, Telnet, Terminal and HTTP are generally available, later in the parts of this manual only the explanation for usage of the HTTP-interface will be provided. **We strongly recommend to use the HTTP interface for configuration and monitoring.**

After you have completed the hardware setup and connected the SNMP-adapter, any of these three methods can be used to configure the adapter for the network. For this purpose depending on the configuration method, a communication must be established between the adapter and user via a serial terminal session or via an established network route in a telnet or HTTP session. **CS121 allows a login only under the username "admin".** Upon entering a telnet- or terminal-session with the adapter an authorization is required for which the **default password** is:

"**cs121–snmp**"

2.1 Setting up basic network configuration

2.1.1 DHCP – Obtain an IP address automatically

By default DHCP is off at all CS121. From CS121 FirmWare Version 4.25.x you can switch on DHCP via DIP switch 2 manually. Therefore the CS121 will get a DHCP IP address from the DHCP server during reboot. Prior of that, you should detect the MAC address of the CS121 to be able to find the IP address on your DHCP server. We recommend to use static IP addresses, because the CS121 is used for multi server shutdowns via RCCMD too and it might be, that the DHCP server got a breakdown. For that reason the delivery state of the CS121 is always with DHCP OFF!

Note: The function DHCP ON/OFF is valid for the following models only: all CS121 HW 131 and all BACS II Webmanager Budget (not valid for all CS121 HW 121, SieteManager, SiteMonitor, MiniSlot and Piller I/O Board)!

2.1.2 Establishment of a static CS121 IP address manually (default delivery state)

The minimum requirement to operate the SNMP-adapter is to set the IP address, subnet mask and the UPS model:

- The DIP-switches of the SNMP-adapter firstly need to be set for the configuration. DIP-switch 1 is switched OFF in the top position as well as DIP switch 2 is switched OFF. Please

note that the DIP switches of the SNMP-slot card adapter are situated on top of the circuit board and DIP switch 2 remains in the OFF position in configuration as well as in the normal mode.

Note: For slot versions you have to insert and remove the device for any reboot-process. This will not have any effect on your UPS but we recommend doing such operations only when the UPS is not supplying any load!

- As soon as the network-LED is flashing, add a TCP/IP route on your computer for IP-address 10.10.10.10. This is done via a call from your command line e.g. "route add 10.10.10.10 <your computers IP address>". See also route -? for more help of route syntax.
- Test if you can ping the device now: Enter command „ping 10.10.10.10" and check if there is any response. Now you can connect with any Telnet or HTTP-software and continue with the configuration.

2.1.3 Using HTTP/Webbrowser

The entire configuration can be done via Webbrowser. Please use the default IP-address 10.10.10.10 and the TELNET password **(default: "cs121-snmp")**. The username is always "admin".

For the configuration using the webbrowser please observe the following:

We recommend the use of Microsoft Internet Explorer 6.x (or higher) or Mozilla 1.3x. Please note, that Java scripting has to be activated. Using Internet Explorer, the corresponding settings have to be made under "Internet options" - "security".

We also recommend never to use the history function of the browser, as this may lead to multiple transfer of commands (e.g. delete event jobs) to the adapter.

Upon entering a HTTP-configuration session, the user is required to enter a username, "admin", in addition to the password "cs121-snmp".

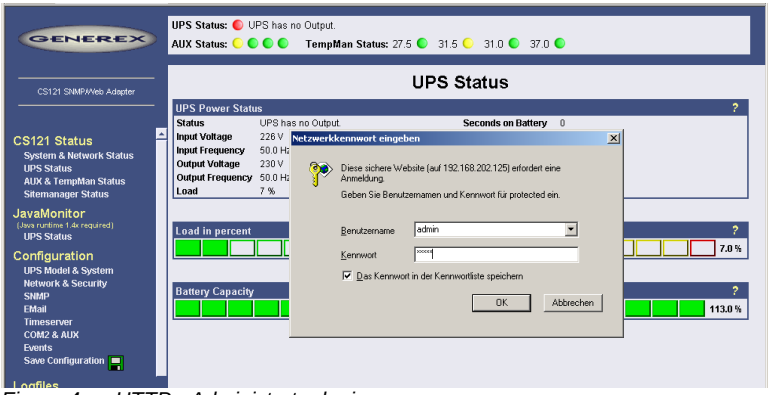


Figure 4: HTTP - Administrator login

Note: If the HTTP-method does not seem to be available, check to see whether or not the red LED UPS Status (see section 1.7 Connect your CS121 ...) is lit.

► Call Configuration, "UPS Model & System" and choose your UPS Model from the drop down list. Further configurations like Power, baud rate, cable type etc. were made automatically (ensure your Browser has enabled JavaScript) and do not need to be set. We strongly recommend to keep the default settings for this UPS unless you have instructions from the UPS maker.

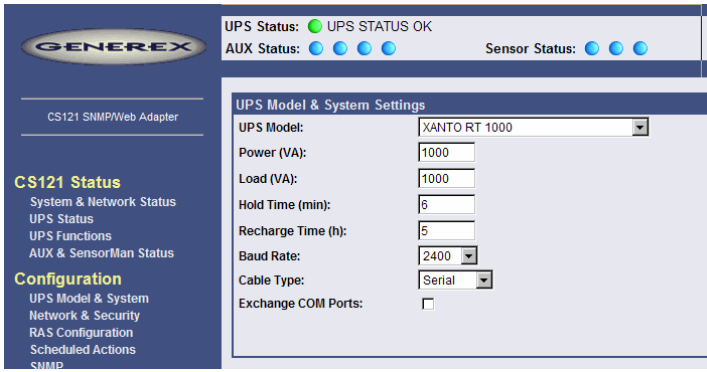


Figure 5: HTTP - UPS Model & System Settings

- Apply your settings with the button at the right side.
- Change to menu “Network & Security” and specify IP-address, Gateway and Subnet mask to the CS121-adapter.

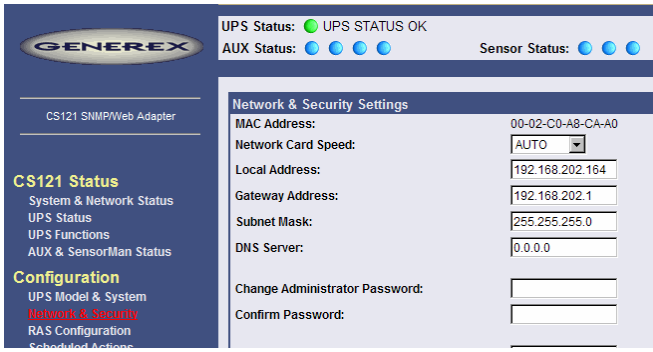


Figure 6: HTTP - Network & Security Settings

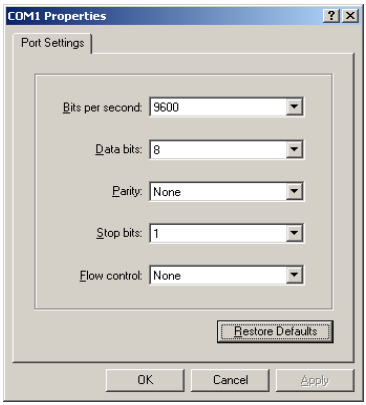
- Apply your settings with the button at the right side.
- Change to menu “Save Configuration” and click “Save Configuration”.

2.1.4 Using Telnet / MS-HyperTerminal

2.1.4.1 Building up a connection

Use of Telnet, enter the command: „telnet <IP-Address>“, whereas <IP-Address> is in the configuration mode set to 10.10.10.10.

Start a Terminalprogram (e.g. MS-HyperTerminal) and ensure that the serial communication cable for COM2 is connected. To build up the connection, mind the following communication settings:



	Adapter
Baud rate	9600
Data bits	8
Parity	None
Stop Bits	1
Flow Control Xon/Xoff	None
Handshaking	None
CR/LF	OFF
Local Echo	OFF
Terminal Type	ANSI (VT100)

Figure 7: Terminal communication settings

Please confirm this window with OK when you have done all settings. The Terminal is now ready for communication with the SNMP-adapter and the main menu will start after the password has been entered. (Default password is “cs121–snmp”).

Note: The number of password-characters is limited in Telnet. Please do never use a password longer than 15 characters if you intend to use the configuration via Telnet!

2.1.4.2 Main menu & IP-Settings

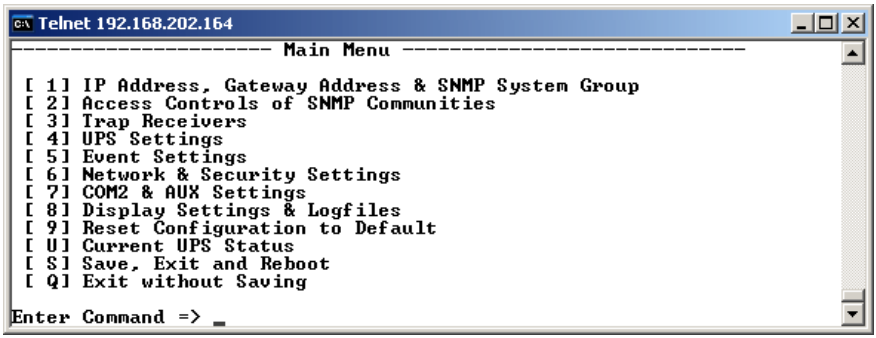

Telnet 192.168.202.164
---------- Main Menu ----------
[1] IP Address, Gateway Address & SNMP System Group
[2] Access Controls of SNMP Communities
[3] Trap Receivers
[4] UPS Settings
[5] Event Settings
[6] Network & Security Settings
[7] COM2 & AUX Settings
[8] Display Settings & Logfiles
[9] Reset Configuration to Default
[U] Current UPS Status
[S] Save, Exit and Reboot
[Q] Exit without Saving
Enter Command => _

Figure 8: Telnet - Main Menu

To select any option in the main menu enter the number of the option at the Enter command => prompt. The program displays the desired screen.

► Type 1 at the prompt and you enter the menu “IP Settings”. Within this menu you can enter basic network configurations, e.g. IP-address, Gateway-address etc.

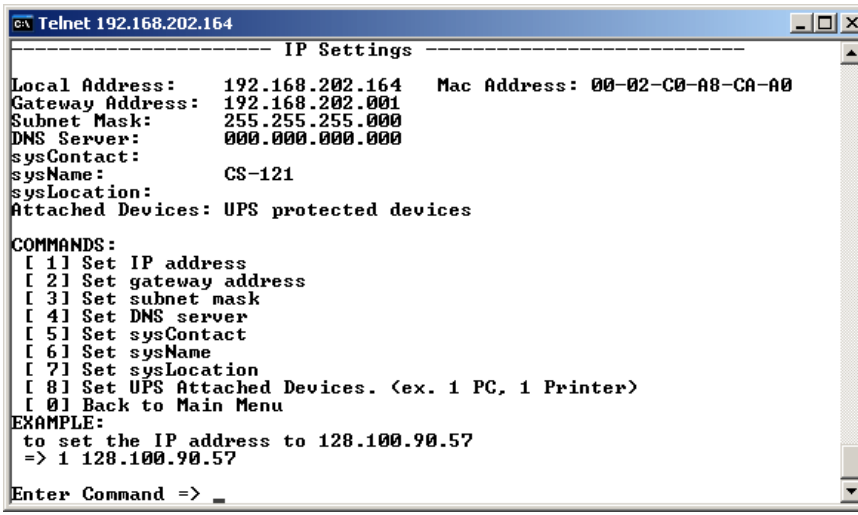


Figure 9: Telnet - IP Settings

To change values, enter the number of the option, type <space> and enter the name. Press <enter>. Your new value displays next to the field heading on the top of the screen. If you want to return to the *main menu*, press 0 (zero) and <enter>.

For example: To assign the IP-address of the SNMP-adapter, the gateway and the subnet mask type at the prompt:

1, <space>, the IP address of the SNMP adapter, <enter>

- Enter Command => 1 192.10.200.0
- Enter Command => 2 192.10.200.254
- Enter Command => 3 255.255.255.0

To assign the system contact name, type 5 and enter the name of the person to contact about the SNMP adapter.

- Enter Command => 5 Mr. Harry Hirsch

To assign the UPS name SysName, type 5 and enter name of the UPS:

- Enter Command => 6 USV 1

To assign the UPS location SysLocation, type 6 and enter the location name:

- Enter Command => 7 Building 12

2.1.4.3 UPS Settings

- Choose option 4 from the main menu and you enter the menu “UPS Settings”. Within this menu the user needs to select the UPS model the CS121-adapter is connected to (usually at COM1).

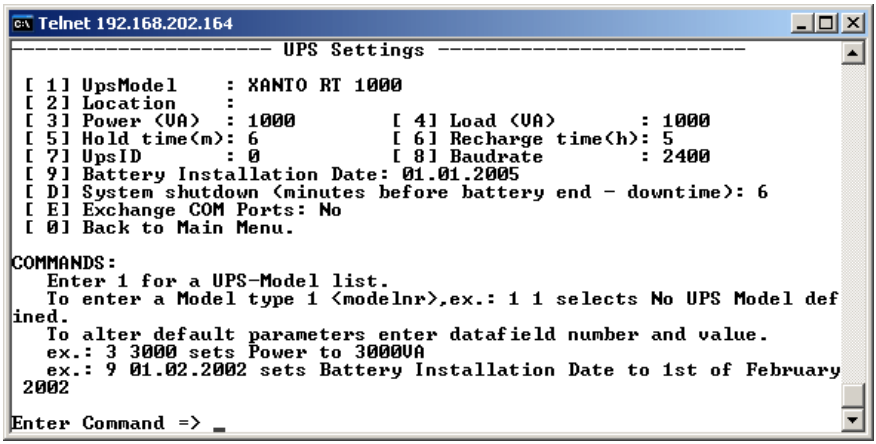

Telnet 192.168.202.164
---------- UPS Settings ----------
[1] UpsModel : XANTO RT 1000
[2] Location :
[3] Power (VA) : 1000 [4] Load (VA) : 1000
[5] Hold time(m): 6 [6] Recharge time(h): 5
[7] UpsID : 0 [8] Baudrate : 2400
[9] Battery Installation Date: 01.01.2005
[D] System shutdown (minutes before battery end - downtime): 6
[E] Exchange COM Ports: No
[0] Back to Main Menu.
COMMANDS:
Enter 1 for a UPS-Model list.
To enter a Model type 1 <modelnr>,ex.: 1 1 selects No UPS Model def
ined.
To alter default parameters enter datafield number and value.
ex.: 3 3000 sets Power to 3000VA
ex.: 9 01.02.2002 sets Battery Installation Date to 1st of February
2002
Enter Command =>

Figure 10: Telnet - UPS Settings

The CS121-adapter distinguishes here generally between Cable- and Serial-models. With Cable, the adapter and the contact interface of the UPS are connected with a special cable. Using Serial, UPS models connect to the adapter via the serial UPS-cable. (Part of the UPS package). Serial is default, when the user selects a UPS model name from the drop-down list. When Cable is used, please search the list for the corresponding UPS model and cable type.

The CS-121 supports serial models with its own RS-232 protocol as well as contact UPS models with the cable types O,C,1-10. Those contact cables are UPS or alarm system specific and should be provided by the corresponding manufacturer. Our Cable documentation shows examples of those cables if they are individually made cables.

Please choose the corresponding Serial UPS model or Cable-model communication parameters. Parameters like baud rate etc. are preset for the corresponding UPS model.

Note: By selecting the UPS model, the communication protocol is selected at the same time. If your UPS does not appear in the list, ask your UPS dealer if another model from the same series can be substituted.

► Select Option 1 to get a variety of possible UPS models. After chosen a model, the default values of the corresponding UPS model can be configured by typing the number of the option followed by the value.

Note: Please do not change parameters except of UPS-model unless you want to choose specified configuration according your UPS-model!

Please note option “D”: “System shutdown (minutes before battery end – downtime)“: This value determines how many minutes before a complete battery unload the event “System shutdown” from event menu is executed.

The shutdown time interval needs to be set large enough, so that adequate time for a system shutdown is allocated before the UPS runs out of power. Please calculate this value generously e.g. if the battery time of the UPS is 10 minutes and the event procedure takes 2,5 minutes, ensure you start (configure) the shutdown (or other event action) 3 minutes before the UPS is switched off, so that more than enough time is available to complete the corresponding event action.

2.1.4.4 Save configuration

► Call **“Save, Exit and Reboot”**-command from the main menu. (The communication to the adapter will be lost).

ATTENTION: Keep the Telnet, Terminal, Webbrowser window **open** until the device has been lost or you see a message that reboot is under progress. If you close the configuration window

too early it may corrupt the upsman.cfg configuration file. (see also section 4 Adapter Software-Updates (Firmware))

Note: Various options and settings for UPS-configuration can be done under Telnet or HyperTerminal, e.g. setting access controls of the SNMP-communities, set traps, set display settings, etc. However, the configuration via Webbrowser offers a much more convenient way to configure the CS121. If you have any possibility we recommend you to use this way.

2.2 Adapter-restart and boot procedure

► After you have finished the basic IP- and network-settings you should set DIP-switch 1 in position ON and restart the adapter with your configurations.

You can perform an adapter restart by unplugging the power supply of the CS121 and wait until the adapter has restarted with your configurations.

Alternatively you can restart the Adapter with the “Reboot”-Option in the “Save Configuration”-menu of the Webbrowser. The following message will displayed:

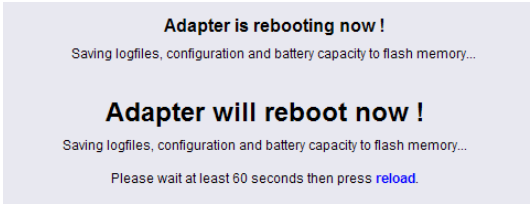

Adapter is rebooting now !
Saving logfiles, configuration and battery capacity to flash memory...
Adapter will reboot now !
Saving logfiles, configuration and battery capacity to flash memory...
Please wait at least 60 seconds then press reload.

Figure 11: HTTP – Adapter reboot dialog

A successful restart of the adapter is indicated with the CS121 UPS- and network-LEDs as described in section 1.7 Connect your CS121 ....

► Reconnect your Webbrowser with the adapter using the configured IP-address. (e.g. http://192.168.10.123)

Your CS121-adapter is now ready for further configurations!

Note: If the adapter’s HTTP-service is not available, check to see whether or not a red Status-LED is lit.
Further, test if you reach the adapter with a ping-command. Enter command „ping <IP-address>“. If the adapter doesn’t answer to the ping, check also whether your network routes the IP-address.

2.3 Introduction in the event configuration

The configuration of the CS121 is based on events, whereupon an event can be an UPS-triggered event such as powerfail, battery low etc., and also events, which are released by the CS121-adapter, like events from the AUX-port or a connected SENSORMANAGER for example.

The CS121-configuration allows you to assign one or more actions to each event. An action can be to send an Email-notification to specific users as well as to perform a shutdown-signal to several client stations. In addition, it is possible to specify when and how often an action is to be released.

2.3.1 About same basic events

Please call the menu “Events / Alarms” in the Web-browser to open the main configuration-site, whereon all configurable events are listed. In the following, we introduce same basic and important events which should be in general handled from every CS121-Adapter. For a complete description in-deep please see section 3 Configuration of the CS121.

- **Powerfail**

The event “Powerfail” will be released when the UPS has lost the power supply. This event is usually used to proceed operations like backup-strategies, batch-files to be executed on client stations etc. pp. You can configure such jobs with the “Remaining time”-parameter to ensure the actions will be executed completely.

- **System shutdown**

The event “system shutdown” will be released, if the configurated “System Shutdown Time” (in the menu “UPS model and system”) is reached. This means, there are yet the configurated minutes left until the battery’s capacity is expected to be finished (as calculated by the adapter).

This event should only be used to proceed all operations concerning your forced shutdown szenarios. Further operations are usually configurated on the event “Powerfail”.

Note: This EVENT is the final task a CS121 can initiate before the UPS switches off! DO NOT use this EVENT for triggering shutdowns via RCCMD etc. because the remaining time in this status is not secure. We strongly recommend to use the event “Powerfail” and configure the RCCMD shutdown calls with a UPS “remaining time”, this is the best way to send RCCMD shutdowns to several IP-addresses in a certain logic or sequence!

- **Battery low**

The event “Battery low” will be released from the UPS when the battery charge has reached a critical state.

- **UPSMAN started**

The event “UPSMAN started” is periodically released in normal operating mode. You can use this event to configure jobs, which should be executed as long as the adapter is working in normal mode.

Note: Same UPS models allows you to configure the thresholds for releasing UPS specific events individual. CS121 also supports these features if the UPS includes this possibility. See also section 3.2.10 Events / Alarms in this manual.

2.3.2 Quickguide to install an RCCMD-job

Condition for setting-up an RCCMD job in the CS121 configuration (like Shutdown for example) is the installation of RCCMD at the client workstation.

Note: Each RCCMD-Installation requires a licence key! Usually, the CS121 Adapter Package includes already one licence key. This license key can only be used **once** per installation. If more computers need to be added to the shutdown process, additional licenses are required.

Please follow the description in section 5.1 RCCMD to install RCCMD at the client-workstation.

After you finished the client-side installation of RCCMD you can configure an RCCMD-job at the CS121-adapter:

For example to configure a job, which initiates a shutdown-signal to a client-workstation, please enter the event “System shutdown” in the menu “Events / Alarms”. The following “Event Editor” then lets you add a new job.

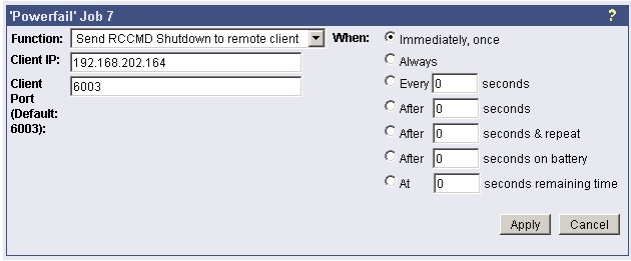


Figure 12: HTTP – Job Editor – Introduction

See the figure above, how to configure the RCCMD shutdown for a Client-Workstation. Note, that you enter the correct IP-Address of the Client.

Now the RCCMD shutdown procedure is already completed. Press the “Test”-Option in the Event Editor to verify your settings.

3. Configuration of the CS121

Note: After you have finished the basic network configuration you should have set DIP-switch 1 in position ON and rebooted the adapter. At the SC slot cards you have to remove the card from its slot and change the DIP Switch 1 to position ON. After this, re-insert the card. Info: There is no risk to remove/insert the slot card, there will be no effect on the UPS output.

3.1 CS121 Status-Monitors

The Menu “System & Network Status” shows basic information about general configuration settings:

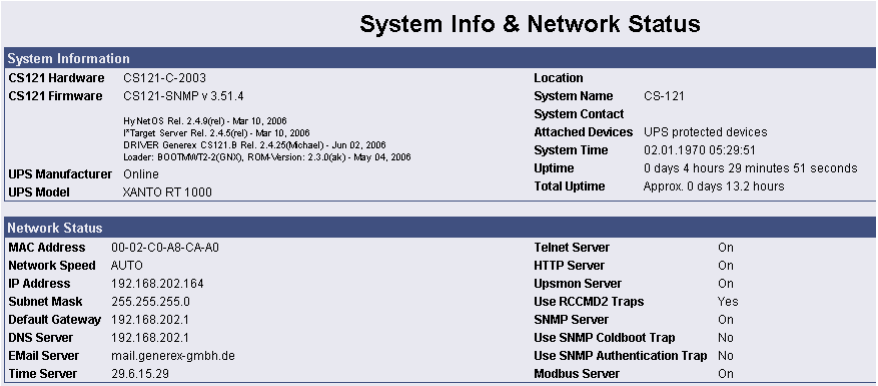


Figure 13: HTTP - System & Network Status

The Menu “UPS Status” gives information about the actual UPS-data, above all the state of charge and battery load:

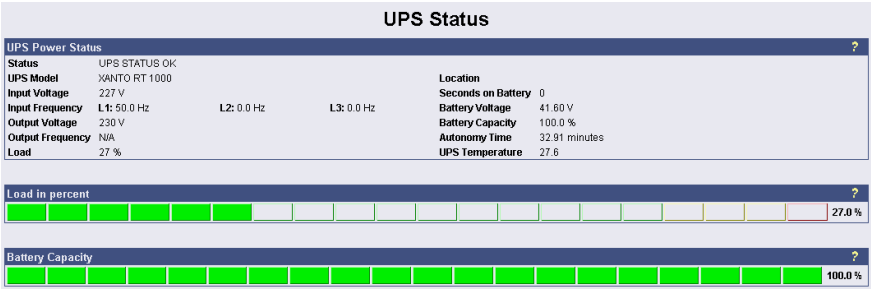


Figure 14: HTTP - UPS Status

The Menu “UPS functions” allows you to perform USV test- and control-scenarios like battery tests, etc. The UPS functions depend on the UPS type and its functions. Some UPS only allow a remote on/off, others have more functions.

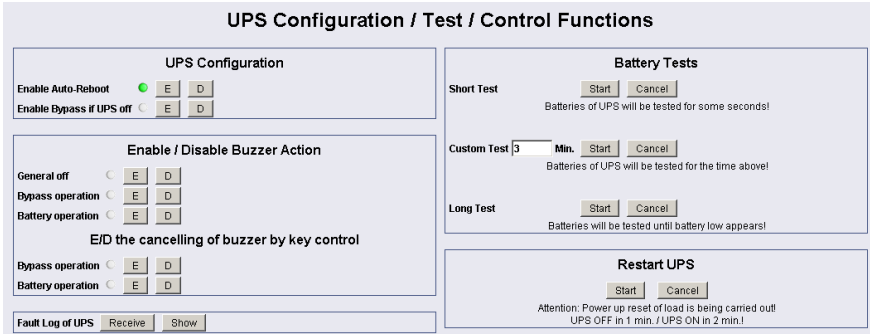


Figure 15: HTTP - UPS Functions

AUX & SensorMan Status:

The AUX & TEMPMAN status shows the actual measurements of the connected environmental sensor devices SM_T_COM, SENSORMANAGER or TEMPMAN.

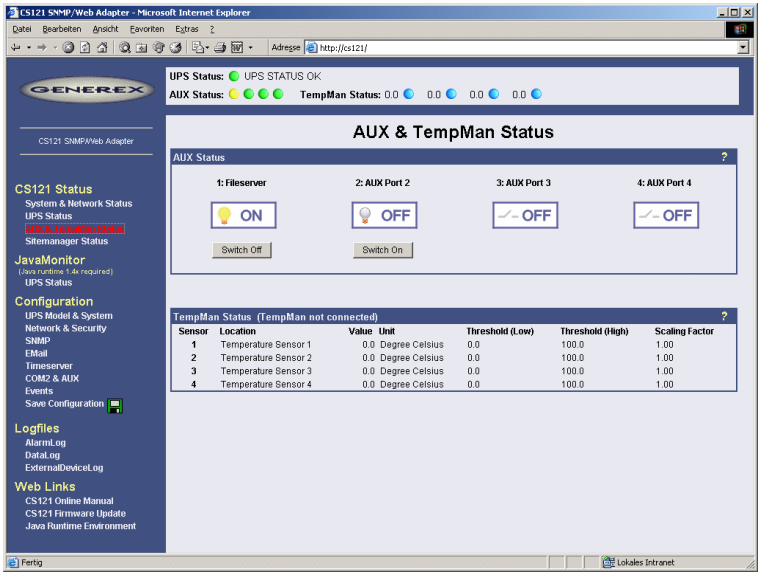


Figure 16: HTTP - AUX & SensorMan Status

In the above figure, a button menu is presented in which the ports 1 and 2 can be clicked on and off. A yellow light bulb indicates that output to the corresponding port is being provided, while the gray unlit light bulb indicates the status of being switched off in which case the connected device is not being provided with power. The buttons „Switch Off“ and “Switch On” are password protected. This is the same password that has been set in the CS121-configuration. The ports 3 & 4 are configured as input sensors, here the OFF symbol shows an open contact, and alarm would show a closed contact. The AUX port of CS121 can be configured as output or input – or a mixture of both.

3.2 Configuration

3.2.1 UPS Model & System

Use this menu to define the communication between the CS121-adapter and your UPS.

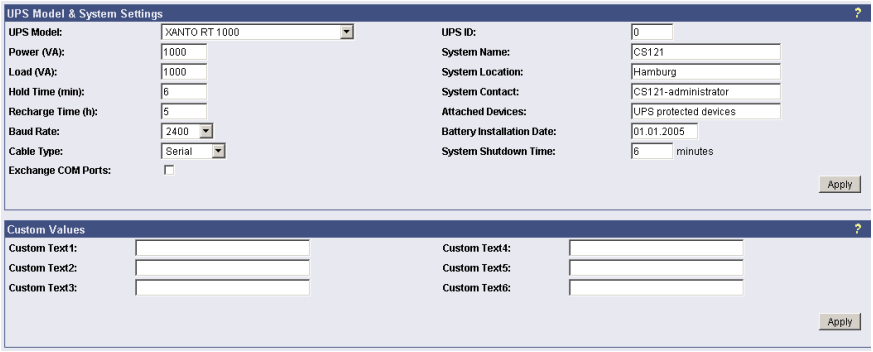


Figure 17: HTTP - UPS Model & System

With the parameters UPS ID, system-name, -location, -contact you can describe the UPS and CS121. This is useful e.g. to locate the UPS physically and can be used among others for event settings.

Note: Do not change the default UPS-Parameters for Baud Rate and Hold time unless you have special instructions from the UPS maker.

Please note the field “System Shutdown Time “: This value determines how many minutes before a complete battery unload the event “System shutdown” from the event menu (please cp. according section 3.2.10 Events / Alarms) is executed. Attention: This EVENT is the final task a CS121 can initiate before the UPS switches off ! DO NOT use this Event for triggering shutdowns via RCCMD etc. because the remaining time in this status is not secure. We strongly recommend to use the Event Powerfail and configure the RCCMD shutdown calls with a UPS “remaining time”, this is the best way to send RCCMD shutdowns to several IP addresses in a certain logic or sequence!

Note: Please apply your changes before leaving the menu to send the values to the CS121-adapter - do not forget to press “SAVE & EXIT & REBOOT” after you have finished your configuration work!

The section „Custom Values“ contains 6 fields with can be used to save custom specific comments concerning your UPS.

3.2.2 Network & Security

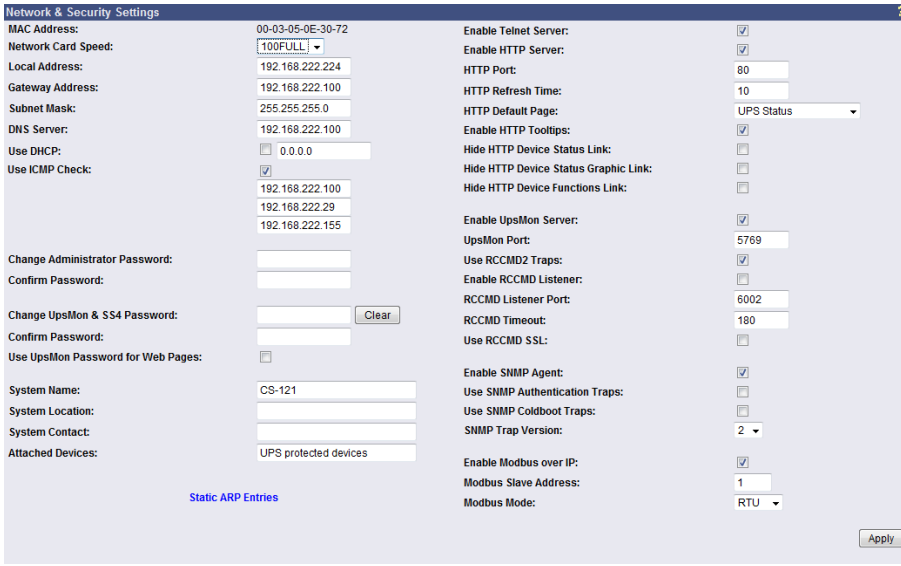


Figure 18: HTTP - Network & Security Settings

This menu configures the CS121 network card settings, passwords and enable/disables several adapter and network services.

Note: **We recommend to set the Network Card Speed *NOT* to "Auto", but rather to the accordant speed of your switch. In addition we recommend to open the TCP/IP and UDP ports only, that the CS121 is using. Please take a look into the chapter Appendix D. D.9 for further information. To fend foreign reboots out of the network, we recommend to disable the port 4000 at your switch. Please note, that you are not able to update the CS121 firmware anymore. Enable the port 4000 again, if you want to update the firmware.**

Enable RCCMD Listener: Among others, here you can allow the CS121 to act as an RCCMD listener client. This makes it possible for another UPSMAN-Manager, CS121, SITEMANAGER or other RCCMD compatible sender to send the adapter an RCCMD command like sending one of the AUX output ports a high or low signal – or to start other actions.

You can also set the MODBUS configurations in this menu. The configuration requires only the following entries:

- **Enable Modbus over IP**: Every CS121 model with Firmware Version 2.0 (or higher) can also transfer UPS data via the MODBUS-protocol on IP (port 502). You may use any MODBUS client to read the UPS value from CS121. For using the RS-485 interface, you must use a CS121MODBUS (special hardware) in other cases you have to use MODBUS-over IP. This is enabled by default, you may disable this feature via Telnet or HTML-configuration.
- **Modbus Slave Address**: Enter the corresponding number, meaning which number in the chain (bus) the adapter is.
- **Modbus Mode**: RTU (Binary mode) or ASCII mode text output. Please select the type with the scroll down menu.

Note:

ASCII Mode works at CS131 & CS121 platforms with communcation parameters 7/E/2, or 7/E/1 or with 7/N/2 from baudrate 1200 to 38400. We recommend for ASCII the use of 7/N/2 and the highest baudrate supported by your device.

RTU Mode works at CS131 & CS121 platforms with communcation parameters 8/E/1 or 8/N/2 or 8/N/1 or 8/E/2 or 8/O/2 or with 8/O/1 from baudrate 1200 to 38400. We recommend for RTU the use of 8/E/1 and the highest baudrate supported by your device.

- **Enable Hardware Watchdog:** (from firmware 3.87) This is a function that should avoid hang-ups of the CS121 HW131 (via network problems or other, external devices). This function is only available at the newer hardware 131, not at the 16bit model CS121 HW121. The hardware watchdog will be triggered every 20 seconds from one of the CS121 services. If they get no response, the CS121 will restart by itself. Thereby the broadcasts like *denial of service attacks* will be switched off reliable. The hardware watchdog should be used only, if you cannot determine the cause of a hang-up. If reboots occur often, please contact the support for an analysis. To switch off the hardware watchdog, uncheck the box “Enable Hardware Watchdog” and click the “Apply” button. Click the *Save Configuration* menu and use the function “Save, Exit and Reboot” and restart the adapter completely. Now achieve a cold start!

- **Change Administrator Password**: The password protects against unauthorized usage and manipulation. The default password is "cs121-snmp". In case you have "forgotten" your password a master password can be generated using your adapter serial number. Please contact your manufacturer for more information.

- **Change UPSMON & SS4 Password**: This is a separate password (default: “cs121-snmp) and allows to open UPS FUNCTIONS and SS4 FUNCTIONS only to specific users. With this password, which is valid for the TCP/IP connection to the UPSMON too, the user may switch on/off the UPS, start battery tests, switch SITESWITCH 4 outputs, but can not change any other setting on the CS121 configuration. Exception: If the administrator password (default identic) was not changed. The UPSMON is a Windows client, which is able to connect via network to the CS121. The UPSMON and SS4 password is used as protection. Advice: For the activation of the new password (apply button), it is required to reboot the CS121 via the „Save, Exit & Reboot“ function.

  The UPSMON password blocks entry to the UPSMON tools battery test and emergency shut down. Knowledge of this password enable users to gain access to these security relevant functions.

3.2.3 The CS121 with DHCP utilization

The *firmware version 4.xx* and higher contains DHCP. With DHCP your CS121 will get an IP address automatically from the DHCP server. Please note, that this address allocation should be fixed, because RCCMD, which checks the addresses of the senders, will not be functional.

Click the “Network & Security” button in the CS121 configuration and check the “Use DHCP” box.

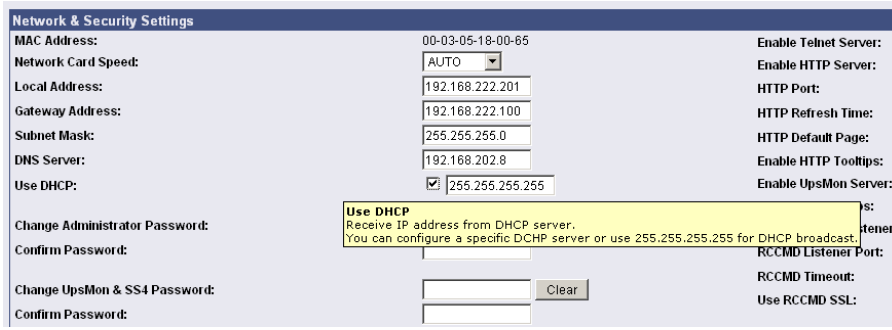


Figure 19: HTTP - Network & Security DHCP Settings

Click the “Apply” button and reboot the CS121 with the “Save, Exit & Reboot” function.

Fallback address: If the DHCP server will not be available, just reboot the CS121 to use the fallback address. This address is equivalent to the settings of the local address in the menu „Network & Security Settings“. When DHCP will be available again, just reboot the CS121 to use the DHCP address.

3.2.4 The CS121 with ICMP Check

From the firmware version 4.26.x the CS121 is able to answer and send ICMP polls, to check the quality of the network and, in need, can reboot itself.

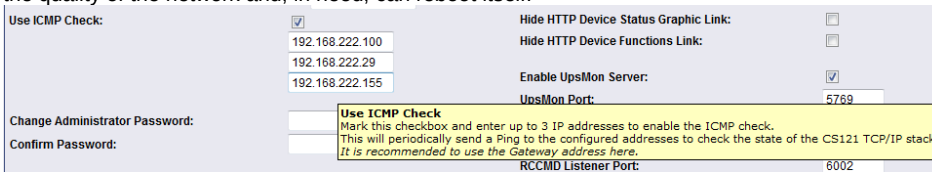

Use ICMP Check:
192.168.222.100
192.168.222.29
192.168.222.155
Change Administrator Password:
Confirm Password:
Hide HTTP Device Status Graphic Link:
Hide HTTP Device Functions Link:
Enable UpsMon Server:
UpsMon Port:
5769
RCCMD Listener Port:
6002
Use ICMP Check
Mark this checkbox and enter up to 3 IP addresses to enable the ICMP check.
This will periodically send a Ping to the configured addresses to check the state of the CS121 TCP/IP stack.
It is recommended to use the Gateway address here.

Figure 20: HTTP - Network & Security ICMP Check

You can enter up to 3 addresses, which will be checked via ICMP. If all 3 addresses are not be reachable, the CS121 will reboot itself after 750 seconds (default). We recommend to use the IP address of a gateway and 2 more addresses, which are reachable steady. If you enter only 1 or 2 addresses, the amount of the checkable addresses is reduced and the possibility to initiate a reboot will increase unnecessarily, because less addresses are at hand for the check of the network quality. If the CS121 will reboot itself often at enabled ICMP check, an analysis of the network is required (e. g. Wireshark), to be able to find the reason. If this should not be possible, you should disable all ports at your switch, which are not required for the CS121, to avoid unnecessarily network traffic. Please take a look into chapter Appendix D., D.9 for further information.

Note: The CS121 supports 3 functions of ICMP via RFC 792:

0 – Echo reply

3 – Destination unreachable

8 – Echorequest

Other RFC 792 functions are not supported

3.2.5 Function hide of HTTP links

The CS121 firmware version 4.23 or higher provides the function to disable the following HTTP links into the “Network & Security” menu:

Figure 21: HTTP – Network & Security Hide HTTP Links

3.2.6 Configuration Static ARP Entries

The CS121 firmware version 4.x or higher provides the configuration of static ARP entries into the "Network & Security" menu:

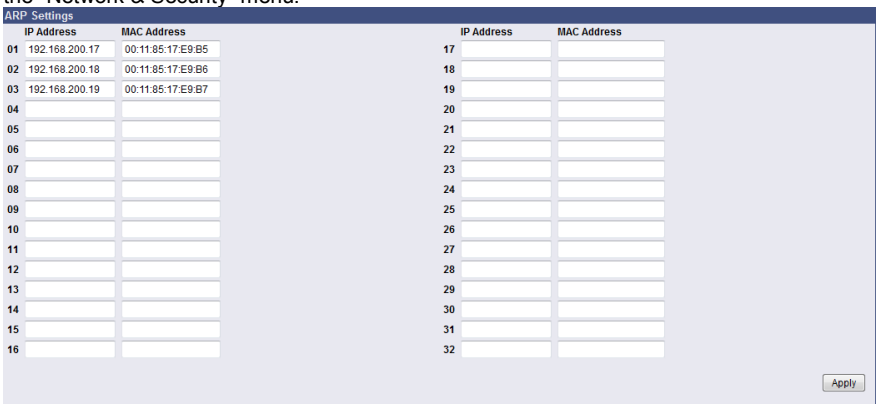


Figure 22: HTTP – Network & Security ARP Settings

You can determine into the ARP Settings, which IP address to which MAC address will be assigned. Therefore the ARP entry will not expire for this IP address. The ARP table will be determined firmly and will never expire! Case of application: HP Teaming or an ARP entry is desired, but the ARP table cannot be restored automatically.

3.2.7 Scheduled Actions

Figure 23: HTTP – Scheduled Actions

In the "Scheduled Actions" menu you can schedule the following actions:

Self test: A self test is a short hardware test, which switches the device to a short discharging.

Battery test: A battery test is a short battery test, which switches the battery to a short discharging.

Custom test: A custom test checks, if the batteries are able to hold the downtime at least.

Full test: A full test is used to calibrate the UPS and will discharge the batteries till the „battery low“ limit. This test should be done once a year at most, because to avoid a damage of the batteries.

Online (inverter mode): This is a function to switch into “Normal Mode” (power supply of the battery). This status is the normal UPS mode and it is actual not necessary to schedule any kind of commands.

Offline (bypass mode): This is a function to switch into “Bypass Mode”. Thereby the inverter of the UPS is not in usage and the current would not be buffered, if a failure would occur. This mode displays a failure of the UPS, please call the UPS service to solve the problem.

Shutdown UPS: This action causes the switch off of the UPS. This could be arranged, if a low charging of the battery occurs, in case of a fire alarm or a power failure happens.

Switch UPS Outlet: This is a function to switch of the UPS outlets (not provided of every UPS).

Switch AUX port: In general the AUX port is used for additional contacts, which can be configured as in- or output (e. g.: as input for alarm contacts of an air conditioner or as an output to switch a connector). If the contacts will be configured as inputs, they are able to be used as event in the “Event Settings”. Additionally you can establish jobs, if they are configured as outputs. The menu “Switch AUX port” is for outputs only. You cannot switch inputs!

RCCMD Shutdown: Here, IP-addresses from computers with RCCMD connection (receivers) in the network can be entered. The CS121-adapter can then initiate a multi-server shutdown. The timing for such a shutdown procedure depends on the configured down time of the adapter (default: time of the remaining capacity of battery in min., during a long power fail.) or on a countdown timer. Extended CS121-adapters can also use more events (e.g. battery low, battery defect, communication lost etc.) as RCCMD signals. Please contact your UPS dealer for more information.

RCCMD Message: With this job the user can combine and configure a text message with RCCMD event. Text messages can be sent to RCCMD receivers. This makes it possible to send text messages via RCCMD (version 2 or higher) to a Windows 2000 server or a Unix computer, using the “NET SEND” or the respective “WALL” method. The problem with notifying network users on different operating systems is therefore solved.
RCCMD Command: This RCCMD signal will cause any RCCMD receiver (e.g. another CS121, RCCMD client or SITEMANAGER, SITESWITCH4) to execute a command or program, e. g.: to start a program at a remote work station.

Native UPS Command: (for very experienced users only) This is a function to execute UPS own commands. Assumption: The user knows the “Command IDs” and the proper parameter. These commands require additional parameter. If you want to use these kind of commands, just contact your UPS dealer.

(De-) Activate Event: This is a function to switch off appointed events/alarms.

Send WOL: WOL stands for “Wake on LAN”. This function uses data packages to prompt other computers in a local network to start-up. Please use this function in the event “UPSMAN started” to wake up computers which have been shut downed previously after an extended power outage, which cause the CS121 or UPS to switch off completely. Additional you may add this WOL signal to the EVENT “Power restored”. Advice: Not every network cards are

providing this function or are password protected. Activate this function into the BIOS settings of the motherboard.

Send Periodic Email: This is a function to send the log files via email periodically (from firmware 4.xx and higher).

3.2.8 Email

If you wish to define actions to send Emails depending on specified events you need to configure the Email settings.

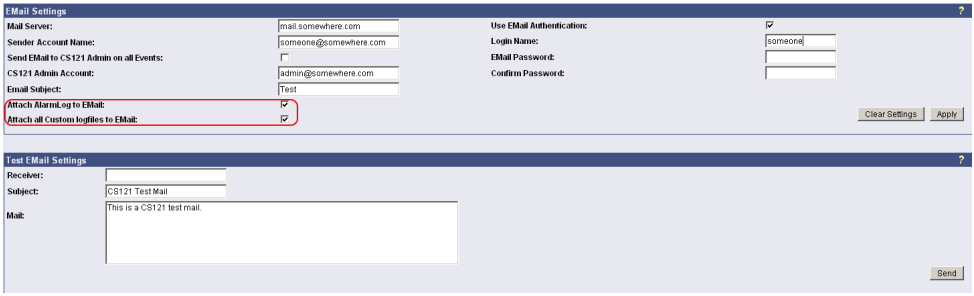


Figure 24: HTTP - Email Settings

In this menu the internet name of your SMTP mail client is required. If DNS is not configured, the actual mail server name's IP-address has to be entered. Please also note that the sender account name (e.g. ups@mailserver.de) should not be a random name since some Emailservers do not allow this. We recommend to use an existing account e.g. ups@mailserver.de. Most servers require matching account name and mail server names. E.g. someone@somewhere.com would be correct, whereas just "someone" would not be sufficient. If the server name and account name do not match, the following error message will be displayed in the CS121 alarm logfile (after some minutes): "Mail: bad answer from mail server: 501 UPSIP204@wrong server.com sender domain must exist."

The user can check the logfile if the email transfer works. The logfile (text.log under the adapter's root directory ../Flash/text.log) can be viewed using FTP, via the UPSMON tool or via the Webbrowser "Alarm log".

The **firmware version 4.xx** provides the function „Attach AlarmLog to Email". Enable it and every email, that will be send from the CS121, will contain the AlarmLog. If you enable the function „Attach all Custom log files to email", every email will contain the AlarmLog, UPSData.log and ExternalDeviceLog. Additionally the email contains the parameters *UPS Model, UPS Location, IP-Address* of the CS121, *System Time* and *Actual Event*.

Mailservers outside the LAN require a username and password. For this function please use "email authentication" and enter a username and the corresponding email password (twice). Note: Do not use email authorization if this is not required by your mailserver !

If authorization is required, the email function "AUTH LOGIN" (the CS121 adapter supports only this function) needs to be supported. (e.g. Freemail.de). This changes the protocol from SMTP to ESMTP and a password is required.

The length of the password should be a minimum 3 and a maximum of 63 characters.

► Send a test-mail to validate your settings after you have applied the mail-settings. A short message on the menu indicates whether the test-mail could be sent or not.

The usage of the settings in the live operation requires the reboot of the CS121 via the "Save, Exit & Reboot" function!

Note: Please ensure that you have specified a DNS-server in menu "Network & Security" if the mail-server could not be reached.

3.2.9 Timeserver

The CS121 uses a timeserver to supply the correct date and time of any event in its local logfile. If no Timeserver is set, the CS121 will not use date and time in the logfile, but a date stamp of 1970. For the normal operation of the CS121 a timeserver is not required, but we strongly recommend to set access to a timeserver.

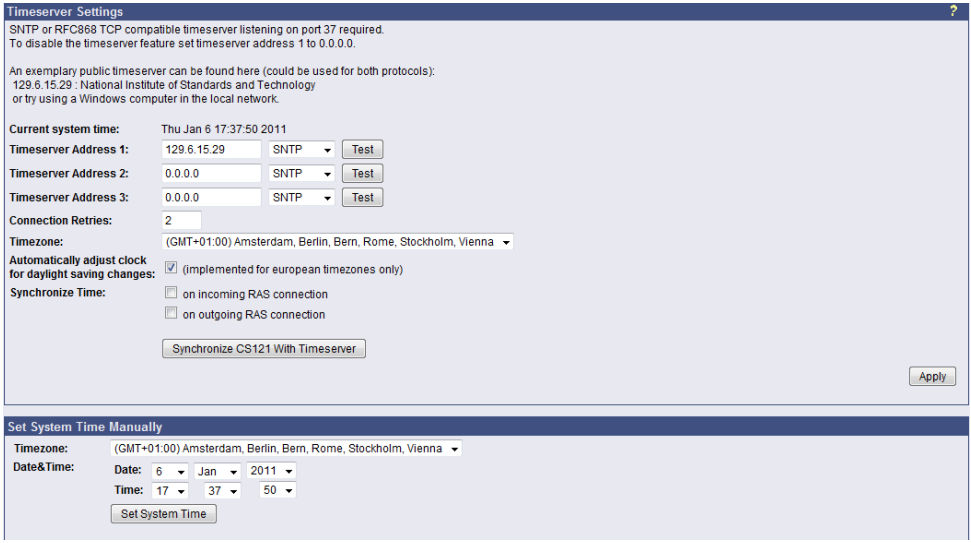


Figure 25: HTTP - Timeserver Settings

The timeserver is important to synchronize the UPS logfile to the actual time. The adapter supports up to three different timeserver IP-addresses. Both, RFC868- and SNTP- protocols are available. Enter the IP-address of any timeserver in your LAN or in the internet. In the internet you will find many timeservers supporting RFC 868 TCP requests, e.g. the IP-address of the timeserver of the National Institute of Standards and Technology is 129.6.15.29; the timeserver of the Physikalisch-Technische Bundesanstalt is 192.53.103.103.

Note: The timeserver will synchronize immediately following the reboot (featured with Firmware 3.03 and newer). If the synchronisation fails, the CS121 will attempt another timeserver synchronisation. Following that, the CS121 will attempt a synchronisation with the timeserver every 24 hours. It is required to unlock UDP port 123. From Firmware 4.17 the timeserver will synchronize in a 10 minute interval for at most 24 hours, after it the synchronization interval will be reduced to 24 hours.

The CS121 firmware version 4.28.x provides the option to set the system time manually. Please note, that after the next reboot the synchronization will be lost.

Attention: The NEWAVE UPS got a special feature: Time synchronization via MODBUS command 99. With this signal, the internal clock of the CS121 will be reset to 01:00 every night, because of the optimization of a correct time. To avoid that the CS121 internet synchronization process will correct this time again (regularly process at every restart and every 24 hours), it is required to disable the SNTP timeserver into the CS121.

Every Windows computer offers the by “Windows Time” a timeserver which synchronizes the time of the PC with an internet clock. How to setup the MS-Timeservice is described below.

If you do not have any internet access in your network, you may setup a timeserver which use the PC clock. For this you may choose any freeware from the internet or download from here: http://www.generex.de/wwwfiles/timeserver/atcs22.zip

• Test Timeserver connection: This option is testing the Timeserver connection with a time and date stamp. Please note that the connection to the timeserver only works, when the adapter is not in the configuration mode (IP 10.10.10.10). The CS121 should have a timeserver to synchronize the UPS alarms with your local time. Without a timeserver the CS121 would use a default time from 1970.

• Microsoft Windows SNTP Timeserver: As timeserver you can use any e.g. Windows PC in your network which has access to a timeserver in the internet or a local PC clock. To use the Microsoft Windows timeserver you have to configure and start the “Windows Time Server” service – see screenshot in the service list:

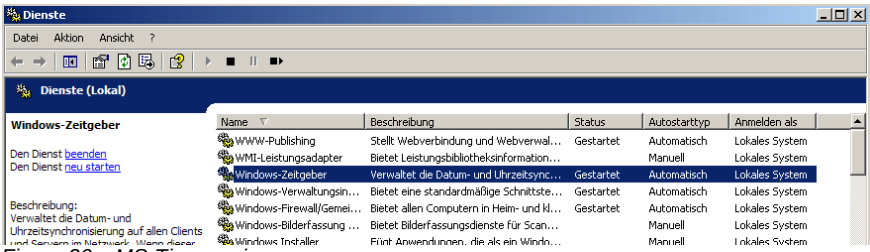
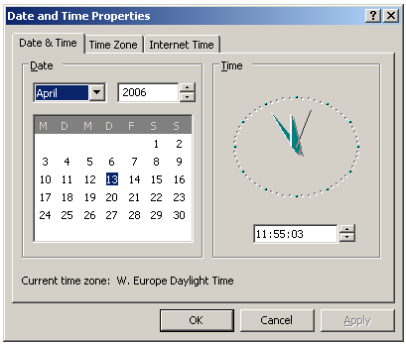
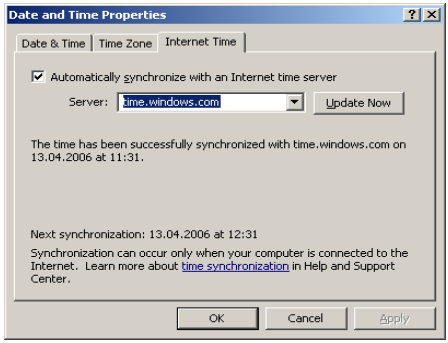


Figure 26: MS-Timeservices

To turn your Windows computer into a timeserver, double-click on the clock in the lower right taskbar and open the following example. After some seconds the tab “Internet Time” appears.

Click on “Internet Time” and check if the timeserver you have chosen here works correctly.




Date and Time Properties
Date & Time
Time Zone
Internet Time
Automatically synchronize with an Internet time server
Server:
time.windows.com
Update Now
The time has been successfully synchronized with time.windows.com on 13.04.2006 at 11:31.
Next synchronization: 13.04.2006 at 12:31
Synchronization can occur only when your computer is connected to the Internet. Learn more about time synchronization in Help and Support Center.
OK
Cancel
Apply

After having configured and started your Microsoft Windows Timeserver you have to reboot your computer and check the Event Logfile of Windows to ensure, the service was started correctly. In this case, you can configure your CS121 Timeserver using the IP-address of this Windows computer.

Note: Please check if your computer is reachable through the network. You may have to change the Windows Firewall settings.

At Windows Server 2003 and 2008, it is required to enable the NTP server into the registry manually. Open the following folder:

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\TimeProviders\NtpServer
Click with the right mouse button onto “Enabled” and change the “Value Data” from 0 to 1.

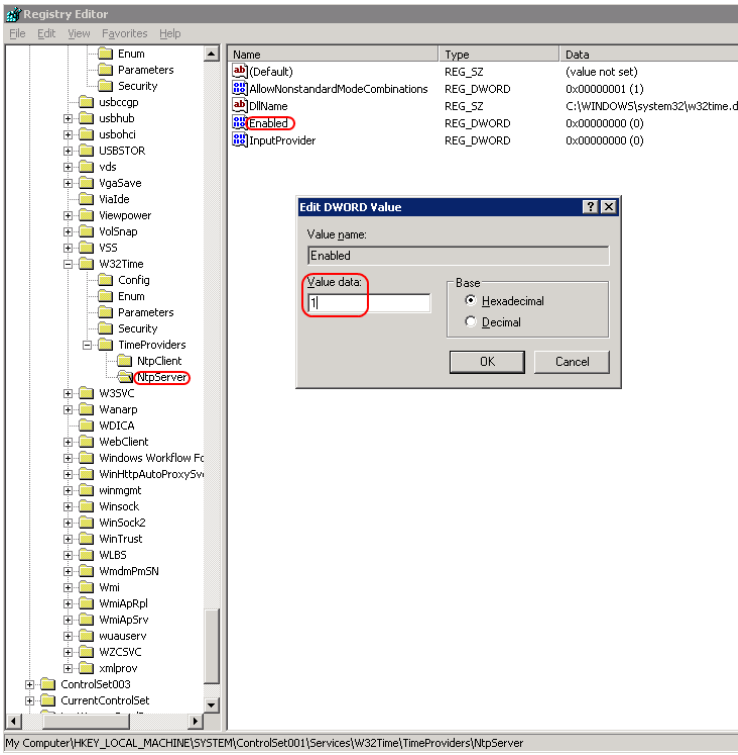


Figure 27: Registry NTP Server

3.2.10 Events / Alarms

The Event/Alarm-pages are the main feature of the CS121-configuration and are based on a combination of events and actions (resp. Jobs). At CS121 there are various events defined, such as e.g. “Powerfail”, “UPS Battery bad”, “Battery low” etc. Each event the CS121-adapter allows you to release one or more actions. An action can be e.g. to write a logfile-entry in the alarm-logfile (as default all events do perform an logfile-event), to send an eMail or to perform an RCCMD-Command (e.g. shutdown signals to several RCCMD Clients). For a short introduction into the handling of Events and Actions see also the section “Quickstart”.

In this menu the relationships between system events such as alarms and the actions to be taken those events are defined.

► To configure your events and actions open the menu “Events / Alarms”. The menu “Event Configuration” shows you an overview about the events and the number of configured actions.

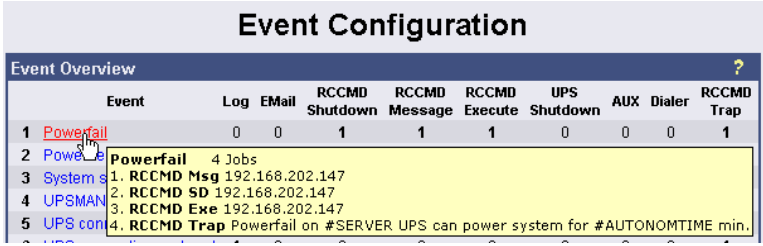


Figure 28: HTTP - Event Configuration with tool tip

► Choose the event you wish to configure to enter the event editor.

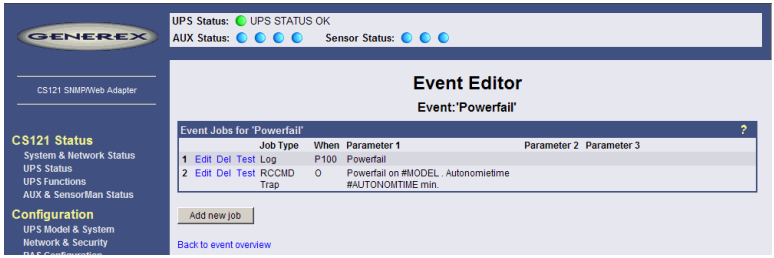


Figure 29: HTTP - Event Editor

The Event Editor allows you to edit, delete and test existing events, as well as to add a new event job. Please click on the desired action to enter the Job Editor, who lets you make the configuration.

Here in the following a short example how to configure an RCCMD-Shutdown signal. For further explanations please see section 3.2.10.5 RCCMD Jobs later on in this manual.

• Generally, the event “Powerfail” (in same environments also named “Backup mode”) should be used to enter the RCCMD-Shutdown commands, where required with a delay (“do after”) or depending on the remaining time.

Event Jobs for 'Powerfail'

		Job Type	When	Parameter 1	Parameter 2	Parameter 3
1	Edit Del Test	Log	P100	Powerfail		
2	Edit Del Test	RCCMD Msg	O	192.168.202.51	6003	Atterntion: Powerfail occured!!!
3	Edit Del Test	RCCMD SD	P12	192.168.123.123	6003	

Figure 30: HTTP – Event Editor, Example of a Shutdown-Configuration

• Additionally, all Actions of the Event “Powerfail” should also be entered in the Event “Battery low” whithout any delay.

• The Event Editor offers you 3 commands on each Job: Edit, Delete and Test. (See figure above) Please note: the Test will perform the execution actually, which means for exeample, that testing a RCCMD-Shutdown Job will actually relealse the Shutdown-Signal at the Client-side! You should perform a Shutdown-test not until you have switched off the Shutdown-procedure at the Client. (RCCMD Configuration, Button Configure shutdown)

• All Jobs are saved not until you executed the Save, Exit and Reboot-Procedure, not until the device is restarted and running in normal mode (DIP-Switch 1 is ON).

• The number of jobs per event ist limited. CS121 Series 2001-2006 allow up to 25 jobs, running under Firmware 3.5x even up to 35 jobs (approximatley, depends on the jobs). If more jobs should be executed, you have to configure RCCMD as relay-station, as described in section 5.1.2.

3.2.10.1 Treshold events

Some UPS models allow you to configure thresholds for releasing UPS specific threshold events individually. CS121 also supports these features if the UPS includes this option. In this case, you see at the main Event menu “Event configuration” at the bottom an additional link “Configure threshold events”. Click here to add a new individual threshold event and you enter the configuration page “Threshold Events”, within you get the possibilities to configure individual events.

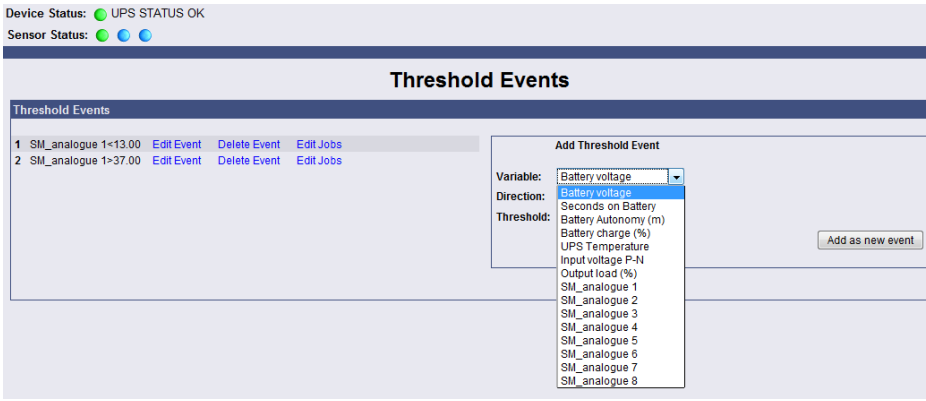


Figure 31: HTTP – Treshold event

The CS121 firmware version 4.27.x or higher provides the option to configure pre-threshold events for the analog sensor inputs (temperature, humidity etc.) additionally. In this example a pre-threshold alarm for a SM_T_COM temperature sensor for the value temperature low of 13°C and temperature high of 37°C were defined. The analogue values for external sensors are configurable through the variable SM_analogue 1-8. The proper threshold events for temperature low of 10°C and temperature high of 40°C were defined into the menu “COM2 & AUX” for the SM_T_COM.

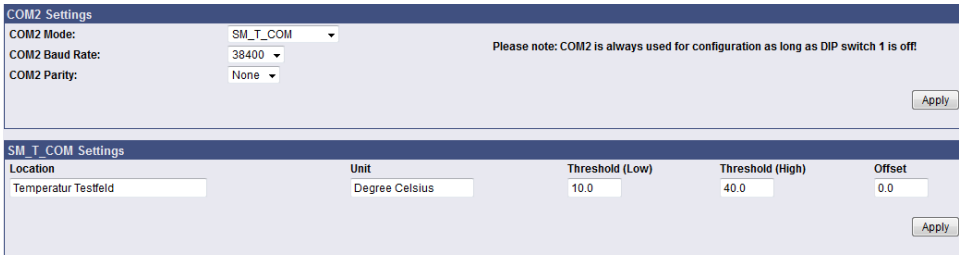


Figure 32: HTTP – COM2 Treshold events SM_T_COM

3.2.10.2 Logfile entries

For a numerous of events logfile-entries are already pre-configured as default. To configure a new logfile-entry, type in the field “Text” the desired message you wish to enter in the logfile and choose the option on the right side, when/how often the message should appear in the logfile.

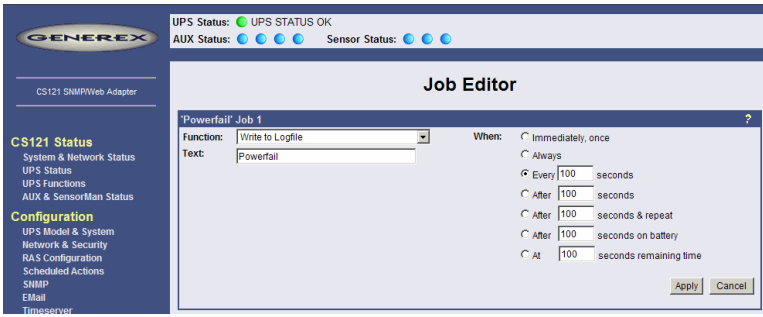


Figure 33: HTTP - Job Editor: Logfile-entry

Example above: The text “Powerfail” will written into the logfile every 100 seconds for as long as the event is present. Other actions on events such as Email, RCCMD-shutdown, UPS-Dialer, TempMan etc. can be configured in the same way. Each event may have an unlimited number of actions (executed now, delayed etc.).

Note: Do not forget to apply your changes before leaving the menu to send the values to the CS121-adapter!

The CS121-logfile is located in the adapter root directory “../flash” The user can read the Alarmlog-file using a FTP connection with the default IP address 10.10.10.10 or the configured IP-address and the username/password combination “admin/cs121-snmp”. Alternatively the logfiles can also be watched with the GENEREX monitor-tools UPSMON or JAVAMON resp. via the Webbrowser. About the logfiles-contents please see also section 3.3 Reading the Logfile.

3.2.10.3 Email-Job

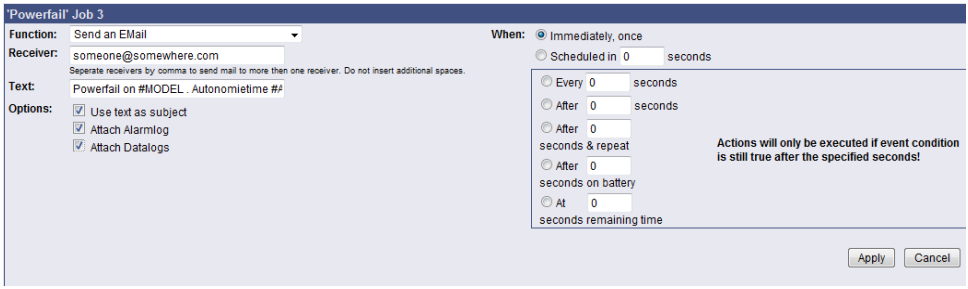


Figure 34: HTTP - Job Editor: Email-Job

To configure an Email-job follow the entries in the figure above.

Note: Please ensure that your Email settings in the menu “Email” are valid. (See also section “Email” above)

Besides text entries, variables can also be integrated into the email from the CS121-adapter. This may personalize your emails. A list of available variables are documentated in the appendix (Section E Available Variables of the CS121). Please mind, that the variables are only getting filled if the event actually occures, not by testing the action. (So simulation is not possible, you have to create a real alarm to see the full message)

For example please see the figure above: There, the variables #MODEL and #AUTONOMTIME will be substituted with their current values when the action will be released.

Please notice the syntax, that each variable name must be started with the character # and must be ended with a <space> character.

► Apply your settings and test the Email-job in the “Event Editor” to ensure Email will be sent.

- **Continuous, periodic events:**

To define an event job which will be executed continuous, e.g. daily, create a job on the event „UPSMAN started“, as in the following figure:

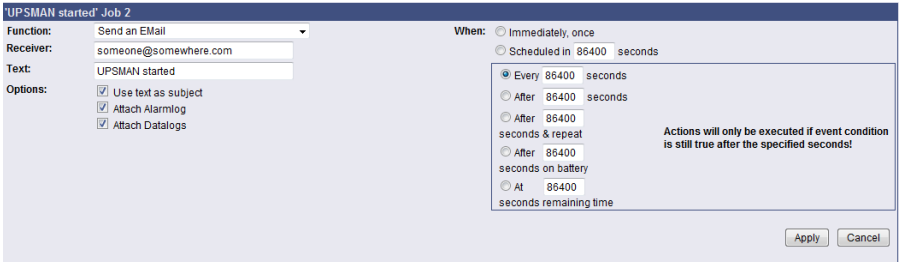


Figure 35: HTTP - Job Editor: Continuous event job

3.2.10.4 Email-To-SMS

In order to send a SMS message in case of an alarm, you have to use the “Email to SMS Service” of your GSM provider. This is a service where the UPSMAN sends an email to the service center of your GSM provider, who converts the email into an SMS. This service is standard in most GSM networks and very reliable compared to modem solutions. For receiving emails as SMS you have to contact your GSM provider to open this service. In the following we describe how this works with some GSM providers in Europe, since these providers change this very often, please refer to the website of your GSM provider to find out how “Email to SMS” can be activated for your cell phone.

Example:

GSM Provider T-Systems D1

Your D1 email address will be D1Nr.@t-d1-SMS.de (e.g.:01711234567@t-d1-sms.de) Please note that you enable receiving emails on your cell phone. This is done by sending a SMS with the message “OPEN”, to the number 8000.
Only the subject or the text field of the email will be transferred as a SMS, 160 characters from the subject and text field.
Important: If you want to stop receiving emails, please send a SMS to the number 8000, with the text “CLOSE”.
(If you want to enable the email transfer again, just send a message to the number 8000, containing the text “OPEN”, as described before.)

GSM Provider Vodafone

In germany the vodafone email-to-SMS server is called „vodafone-sms.de“. Please take a look onto the vodafone website of your country for the accordant server name.
Please note that you enable receiving emails on your cell phone. This is done by sending a SMS with the message “OPEN”, to the number 3400.
Only the subject or the text field of the email will be transferred as a SMS, 160 characters from the subject and text field.
Important: If you want to stop receiving emails, please send a SMS to the number 3400, with the text “CLOSE”.
(If you want to enable the email transfer again, just send a message to the number 3400, containing the text “OPEN”, as described before.)
Other providers
Please ask your cell phone network provider for informations about the email to SMS settings.

3.2.10.5 RCCMD Jobs

RCCMD (Remote Console Command) is the world’s most successful shutdown client for heterogeneous networks and is the most secure way to establish a UPS multiple server shutdown sequence today. RCCMD clients are listening to an RCCMD server which is usually an UPSMAN software, CS121 or any third-party UPS manager which has a license to use RCCMD. An RCCMD server is found inside any CS121 and is triggering RCCMD clients in case of alarms. Therefore RCCMD requires such listeners on each client-computer you wish to

forward RCCMD signals. For installation of RCCMD at client-side please see the section in chapter “Add-on software”.

Note: RCCMD clients are optional and not freeware. Most CS121 are equipped today with a single RCCMD standard license, some UPS makers add more licenses, other do not deliver any license at all with a CS121. Contact your UPS maker and ask for the license regulations for RCCMD in conjunction with your CS121.

- Certain pre-settings are imperative for all RCCMD actions.

- First of all in general regards to the CS121-adapter as an UPSMON Server, the „Enable UpsMon Server“ and the „Use RCCMD2 Traps“ controls boxes must be checked in menu “Network & Security Settings”. (default is ON) This enables the CS121 to execute its RCCMD actions.
- Secondly, the CS121 adapter and the RCCMD client must both be appropriately configured in order to reach one another using RCCMD commands over the network.

- Because the CS121 adapter plays an active roll when executing its actions “Message”, “Shutdown” and “Command” (that is to say the CS121 -adapter sends an RCCMD-signal to an RCCMD client), it is necessary, to enter the IP-address in parameter 1, and the port number of the RCCMD client in parameter 2 (default port is 6003). Additionally, the RCCMD client must either be pre-configured with absolutely no sender filter or should be pre-configured with the IP-addresses of the particular UPSMAN servers (like UPSMAN, CS121 or other RCCMD compatible sender) that are to function as recognized senders. These configurations take place when installing the RCCMD client service. Further details are in the RCCMD software documentation.

Attention: At the function RCCMD Command it is required to configure a job for every single client. It is not possible to request several clients/IP-addresses in one job to execute a command.

- RCCMD also includes the feature “RCCMD Trap”. RCCMD Trap is a method for sending information to the RCCMD stations which have been applied to the CS121. RCCMD Traps invokes messages at all RCCMD stations. Because of RCCMD plays an active roll in this mode no receiver information is to be entered in the parameters of this job (see also following sections). It is condition to enable the RCCMD Trap control box in the menu “Network & Security Settings”.

- The CS121-adapter uses the parameter-based RCCMD Version 2, which can execute different actions on the same TCP channel. RCCMD Version 1 clients can only execute one action (shutdown file execution as default, so any RCCMD signal which is transmitted to an RCCMD client V1 will cause a shutdown of this server) RCCMD Version 3 is capable to handle also redundant UPS installations (eg. PC with 2 power supplies and 2 UPS).

Note: For all 3 RCCMD event functions a list of the user configured RCCMD receivers appear in every RCCMD event.

3.2.11 The amount of RCCMD clients is limited and dependent of the size of the clients per CS121 are guaranteed. If you need more than 50 clients to reach, to use RCCMD relays (see chapter 5.1.4). However it is only possible to the same time, meaning that the first 50 RCCMD clients are executed etc. We recommend to change the timing parmeters of the RCCMD-jobs that 50 commands are transmitted at the same time. We also recommend to use as Relaystation if you want to shutdown more than 50 computers from a section 5.1.2 RCCMD with SSL for Windows

The Secure Sockets Layer (SSL) protocol is a cryptographic protocol that provides security and data integrity for communications over TCP/IP networks.

Use your Web-browser to navigate to the address of your UPS Web-Manager. Click the “Network & Security” configuration button and enable the SSL network feature.

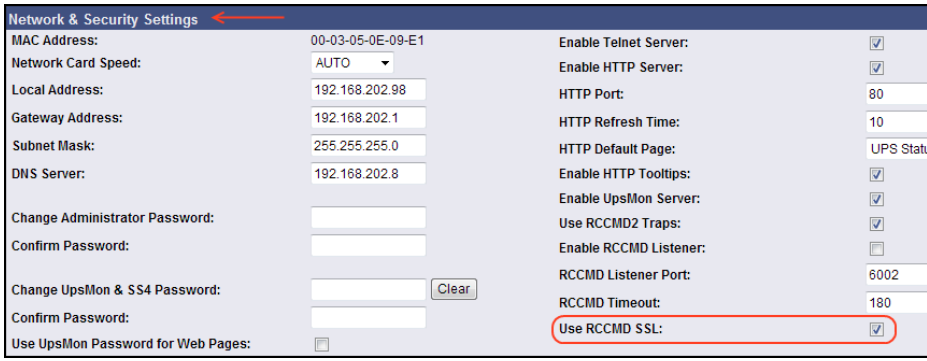


Figure 36: RCCMD SSL Settings

The SSL network feature requires correct time settings, so it is required to configure a timeserver. Click the „Timeserver“ configuration button and enter the address of at least one timeserver.

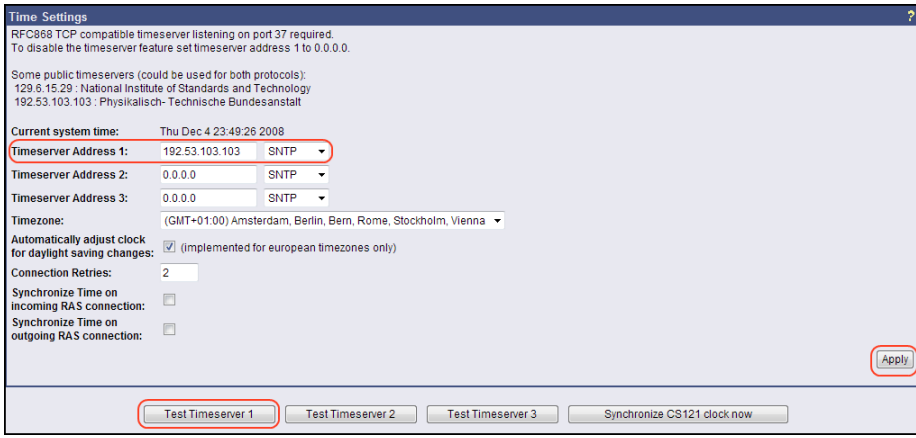

Time Settings
RFC868 TCP compatible timeserver listening on port 37 required.
To disable the timeserver feature set timeserver address 1 to 0.0.0.0.
Some public timeservers (could be used for both protocols):
129.6.15.29 : National Institute of Standards and Technology
192.53.103.103 : Physikalisch- Technische Bundesanstalt
Current system time: Thu Dec 4 23:49:26 2008
Timeserver Address 1: 192.53.103.103 SNTP
Timeserver Address 2: 0.0.0.0 SNTP
Timeserver Address 3: 0.0.0.0 SNTP
Timezone: (GMT+01:00) Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna
Automatically adjust clock for daylight saving changes: (implemented for european timezones only)
Connection Retries: 2
Synchronize Time on incoming RAS connection:
Synchronize Time on outgoing RAS connection:
Apply
Test Timeserver 1
Test Timeserver 2
Test Timeserver 3
Synchronize CS121 clock now

Figure 37: Timeserver Settings

Click the „Save Configuration“ button and the „Save, Exit & Reboot“ button to confirm your settings.

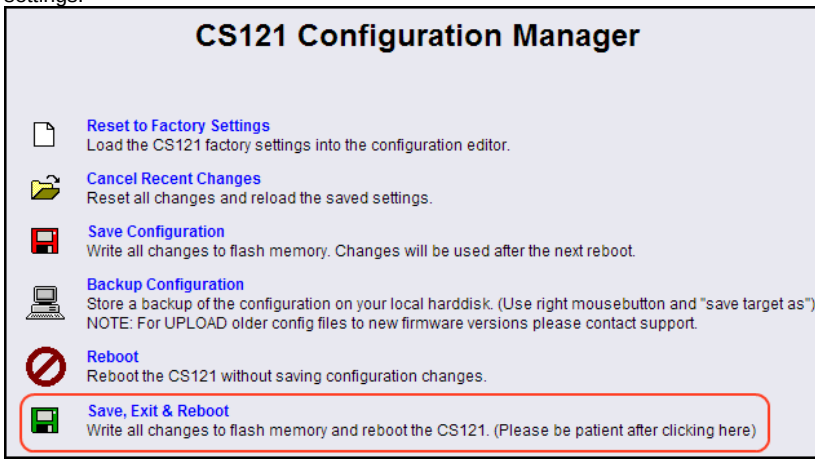

CS121 Configuration Manager
Reset to Factory Settings
Load the CS121 factory settings into the configuration editor.
Cancel Recent Changes
Reset all changes and reload the saved settings.
Save Configuration
Write all changes to flash memory. Changes will be used after the next reboot.
Backup Configuration
Store a backup of the configuration on your local harddisk. (Use right mousebutton and "save target as")
NOTE: For UPLOAD older config files to new firmware versions please contact support.
Reboot
Reboot the CS121 without saving configuration changes.
Save, Exit & Reboot
Write all changes to flash memory and reboot the CS121. (Please be patient after clicking here)

Figure 38: Settings Confirmation

Start the RCCMD Wizard installation again and enable the SSL network feature.

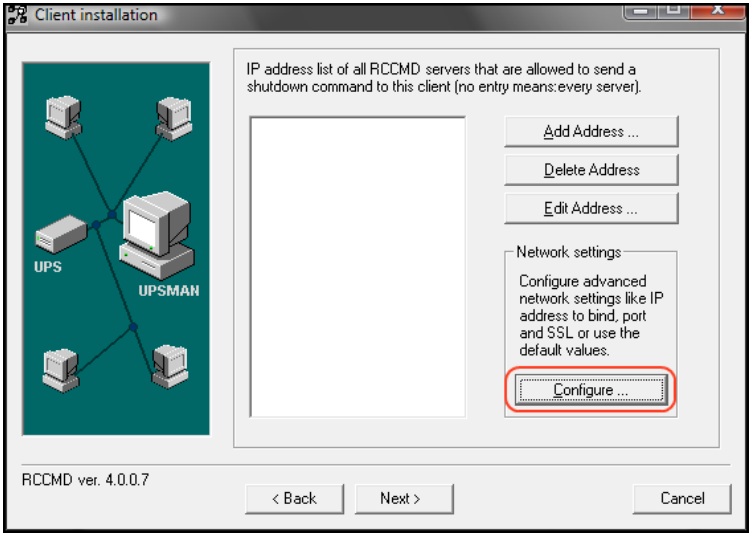

Client installation
IP address list of all RCCMD servers that are allowed to send a shutdown command to this client (no entry means:every server).
Add Address ...
Delete Address
Edit Address ...
Network settings
Configure advanced network settings like IP address to bind, port and SSL or use the default values.
Configure ...
UPS
UPSMAN
RCCMD ver. 4.0.0.7
< Back
Next >
Cancel

Figure 39: SSL Configuration

Figure 40: Advanced Network Settings

3.2.12 RCCMD with own SSL certificates

In this chapter we will describe, how to use an own SSL certificate with RCCMD, e. g. OpenSSL (http://www.openssl.org):

Be your own CA

Using OpenSSL it is quite simple to become your own CA. Just run:

```
CA.pl -newca
```

Done! Just ensure, that you select a useful CN (common name)!

Create your RCCMD certificate

You need to create your certificate for RCCMD now. As it will use it for verification, it should contain the same useful common name (CN), that you selected for the CA. The private key must not be encrypted to let the RCCMD Client (service) start without trouble. Therefore we use the “–nodes” option and the “-newreq” command:

```
CA.pl -newreq -nodes
```

Sign with your CA:

```
CA.pl -sign
```

Now create an empty file named “rccmd.pem“ and copy the cert information of *newcert.pem* (rccmd certificate), *newkey.pem* (private key) and *cacert.pem* (CA) into it. Please note, that the exact copying is required to use it without trouble!

Use your own RCCMD certificate

Do the following steps at the RCCMD Client and every sender (e. g. UPS Web Manager):

- Backup the existing “rccmd.pem”
- Replace the existing “rccmd.pem” with your own
- Restart the RCCMD Client
- Restart the RCCMD Sender

- RCCMD client as relay station)

Note: The RCCMD timeout is 60 seconds, meaning that after this time the communication to the RCCMD client will be stopped and a logfile entry will be made. When an OK response from the client is received, the system assumes a successful RCCMD Shutdown and proceeds with a shutdown of the next 50 RCCMD clients. Every minute one batch of up to 50 RCCMD clients can be executed without SSL.

License regulations:

Please note that in order to use these functions legally, the corresponding RCCMD client program is installed and started from the UPS-Management Software CD. The RCCMD license code can only be used once per installation. If more computers need to be added to the shutdown process, additional RCCMD client licenses are required.

Note: All network components, such as routers, hubs etc. need to be fully UPS-supported, as it is otherwise not possible to reach all clients during the network shutdown.

3.2.12.1.1 RCCMD Shutdown

Figure 41: HTTP - Job Editor: RCCMD Shutdown

Here, IP-addresses from computers with RCCMD connection (receivers) in the network can be entered. The CS121-adapter can then initiate a multi-server shutdown. The timing for such a shut down procedure depends on the configured down time of the adapter (default: time of the remaining capacity of battery in min., during a long power fail.) or on a countdown timer. Extended CS121-adapters can also use more events (e.g. battery low, battery defect, communication lost etc.) as RCCMD signals. Please contact your UPS dealer for more information.

Please note at the configuration of the timer box, that the time specifications outside the timer box (Immediately, once and Scheduled in) will be ALWAYS executed. The time specifications inside the timer box (Every/After seconds, After seconds & repeat, After seconds on battery, At seconds remaining time) will be only executed, if the alarm/event is still present.

Note: For security reasons we recommend to make the same RCCMD shutdown entries for the Event “Battery low” - but in this Event without any delays to avoid that the server crashes because of low battery alarm.
In case a connection is established using telnet or http, the RCCMD-command can be tested without using disrupting power to the UPS. At the Web-browser you simply have to press “test” to transmit the shutdown signal immediately. (see figure HTTP - Event Editor above)
Due to network settings it is possible that this test is answered with "failed". The signal is often sent and received although the receiver may not respond correctly. In such cases, only use the receiver side to check if the signal has actually been received. For checking the communication between RCCMDs you have to check the RCCMD log file on both sides. In the CS121 the logs are inside the Alarm log, at the RCCMD client side the logs are found inside the RCCMD folder e. g. Rccmd.log.

Example for the configuration of a RCCMD Shutdown

Click on the CS121 Web-interface in the menu „Configuration“ the *Events/Alarms* button.
Select the event *Powerfail*.

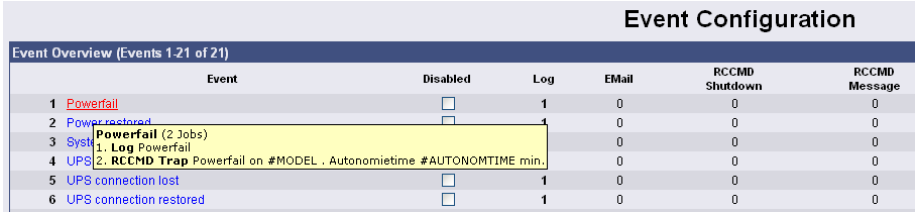

Event Configuration
Event Overview (Events 1-21 of 21)
Event
Disabled
Log
EMail
RCCMD Shutdown
RCCMD Message
1 Powerfail 1 0 0 0
2 Power restored 1 0 0 0
3 Syst 0 0 0
4 UPS 0 0 0
5 UPS connection lost 1 0 0 0
6 UPS connection restored 1 0 0 0
Powerfail (2 Jobs)
1. Log Powerfail
2. RCCMD Trap Powerfail on #MODEL . Autonomietime #AUTONOMTIME min.

Figure 42: HTTP – Event Configuration

Click the “Add new job” button.

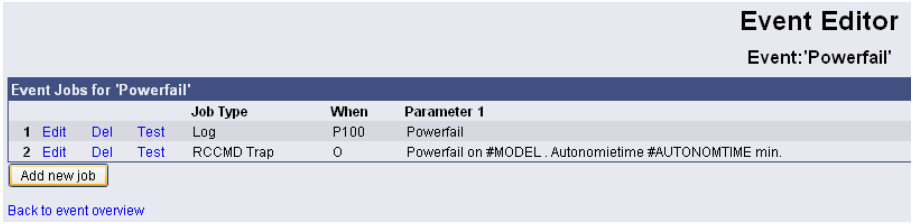

Event Editor
Event:'Powerfail'
Event Jobs for 'Powerfail'
Job Type
When
Parameter 1
1 Edit Del Test Log P100 Powerfail
2 Edit Del Test RCCMD Trap 0 Powerfail on #MODEL . Autonomietime #AUTONOMTIME min.
Add new job
Back to event overview

Figure 43: HTTP – Event Editor

Select the function “Send RCCMD Shutdown to remote client” in the Job Editor:

Figure 44: HTTP - Job Editor

Enter the ip-address of the client, that should receive the shutdown.

Description of the scheduler box :
"**Immediately, once:** Action/Job will be executed in case that this EVENT is true **immediately**, only **once** the Action/Job is started (no repeat)".
"**Scheduled in”:** Action/Job will be executed in case that this EVENT is true with a **scheduled delay** of x seconds. Unregarded if the EVENT is still true or not, after the delay the action will be started.

The timer settings in the blue framed scheduler box will be executed only, if the EVENT is still true after the delays/countdowns have run out.
E.g. if any action has been configured at "do after 10 seconds" than this action will NOT be started, if after 9 seconds the EVENT is no longer true. Only if 10 seconds this EVENT was present, the action will be triggered.

See below the explanation of all timer event configuration options for this type :

"Always”: Action/Job will be executed in case that this EVENT is true immediately and **repeated always** as long as the EVENT is true (every 5 seconds according to poll cycle default of a CS121).
"Every x seconds”: Action/Job will be executed in case that this EVENT is true with a delay

of x seconds and **repeated** every x seconds again.
"After x seconds": Action/Job will be executed in case that this EVENT is true **after** a delay of x seconds. Action will be cancelled, if EVENT is false before time has run out.
"After x seconds and repeat": Action/Job will be executed in case that this EVENT is true **after** a delay of x seconds and will be **repeated** after x seconds again. Action will be cancelled, if EVENT is false before time has run out.
"After x seconds on battery": Action/Job will be executed in case that the EVENT UPS ON BATTERY or POWERFAIL is true and **after** a delay of x seconds. Action will be cancelled, if EVENT is false before time has run out. This Job is identical to the EVENT POWERFAIL and the configuration "After x seconds".

"At seconds remaining time": Action/Job will be executed in case that the UPS runs on battery/Powerfail and the remaining time, read by the UPS or calculated by the internal CS121 routine has reached a certain remaining time. Only useful if the "Autonomytime" of your UPS can be regarded as reliable.

"REMAINING TIME " is defined as Autonomytime in seconds of this UPS at the actual discharging level minus the DOWNTIME (configured in menu UPS MODEL & SYSTEM, default is 3/6 minutes).

Figure 45: HTTP - Job Editor / Function

In this example a RCCMD Shutdown is configured for the event *Powerfail*. The shutdown signal should be send after 5 minutes (300 seconds). Click the „Apply" button after you have finished the configuration. Save your settings via the menu „Save Configuration" and execute the „Save, Exit & Reboot" function.

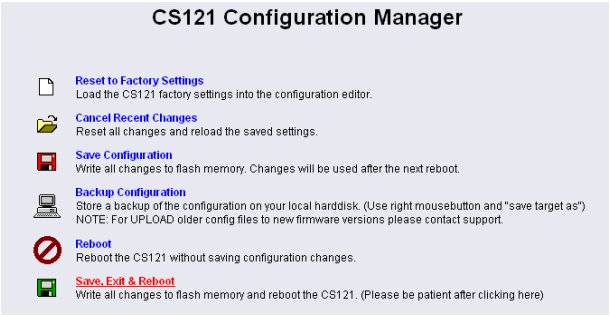

CS121 Configuration Manager
Reset to Factory Settings
Load the CS121 factory settings into the configuration editor.
Cancel Recent Changes
Reset all changes and reload the saved settings.
Save Configuration
Write all changes to flash memory. Changes will be used after the next reboot.
Backup Configuration
Store a backup of the configuration on your local harddisk. (Use right mousebutton and "save target as")
NOTE: For UPLOAD older config files to new firmware versions please contact support.
Reboot
Reboot the CS121 without saving configuration changes.
Save, Exit & Reboot
Write all changes to flash memory and reboot the CS121. (Please be patient after clicking here)

Figure 46: HTTP – CS121 Configuration Manager

We recommend to test the configuration prior of the implementation of the shutdown function into a live-system. Click into the Event Editor of *Powerfail* the "Test" button (Job Type: RCCMD SD).

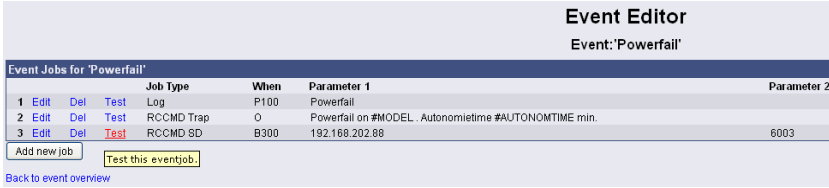

Event Editor
Event:'Powerfail'
Event Jobs for 'Powerfail'
Job Type When Parameter 1 Parameter 2
1 Edit Del Test Log P100 Powerfail
2 Edit Del Test RCCMD Trap 0 Powerfail on #MODEL. Autonomietime #AUTONOMTIME min.
3 Edit Del Test RCCMD SD B300 192.168.202.88 6003
Add new job
Test this eventjob.
Back to event overview

Figure 47: HTTP – Event Editor / Test

After you have clicked the "Test" button (Attention! The shutdown will be executed immediately without consideration of the defined delay), the following message will be displayed:

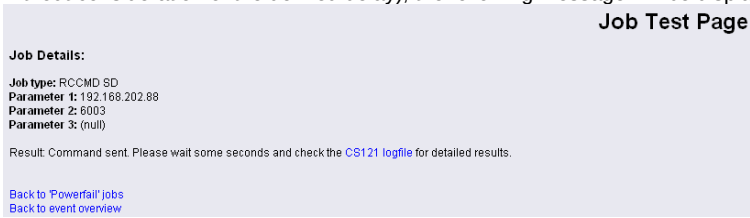

Job Test Page
Job Details:
Job type: RCCMD SD
Parameter 1: 192.168.202.88
Parameter 2: 6003
Parameter 3: (null)
Result: Command sent. Please wait some seconds and check the CS121 logfile for detailed results.
Back to 'Powerfail' jobs
Back to event overview

Figure 48: HTTP – Job Test Page

You can see the successful sending of the signal into the "AlarmLog":

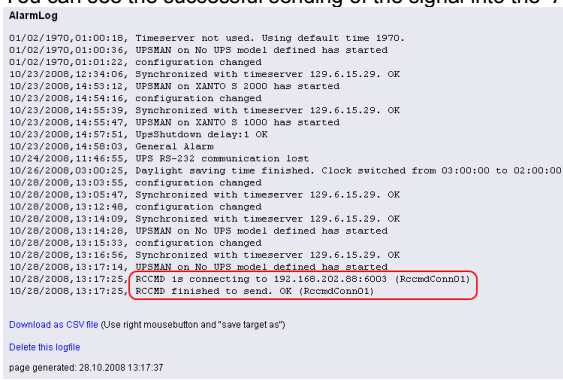

AlarmLog
01/02/1970,01:00:18, Timeserver not used. Using default time 1970.
01/02/1970,01:00:36, UPSMAN on No UPS model defined has started
01/02/1970,01:01:22, configuration changed
10/23/2008,12:34:06, Synchronized with timeserver 129.6.15.29. OK
10/23/2008,14:53:12, UPSMAN on XANTO S 2000 has started
10/23/2008,14:54:16, configuration changed
10/23/2008,14:55:39, Synchronized with timeserver 129.6.15.29. OK
10/23/2008,14:55:47, UPSMAN on XANTO S 1000 has started
10/23/2008,14:57:51, UpsShutdown delay:1 OK
10/23/2008,14:58:03, General Alarm
10/24/2008,11:46:55, UPS RS-232 communication lost
10/26/2008,03:00:25, Daylight saving time finished. Clock switched from 03:00:00 to 02:00:00.
10/28/2008,13:03:55, configuration changed
10/28/2008,13:05:47, Synchronized with timeserver 129.6.15.29. OK
10/28/2008,13:12:48, configuration changed
10/28/2008,13:14:09, Synchronized with timeserver 129.6.15.29. OK
10/28/2008,13:14:28, UPSMAN on No UPS model defined has started
10/28/2008,13:15:33, configuration changed
10/28/2008,13:16:56, Synchronized with timeserver 129.6.15.29. OK
10/28/2008,13:17:14, UPSMAN on No UPS model defined has started
10/28/2008,13:17:25, RCCMD is connecting to 192.168.202.88:6003 (RccmdConn01)
10/28/2008,13:17:25, RCCMD finished to send. OK (RccmdConn01)
Download as CSV file (Use right mousebutton and "save target as")
Delete this logfile
page generated: 28.10.2008 13:17:37

Figure 49: HTTP – AlarmLog

3.2.12.1.2 Automatic Reset of the Redundancy Alarm

You can use the function „Send RCCMD cancel shutdown", to discard a previously sent shutdown automatically. If a shutdown was suppressed, because of the existing redundancy at this point of time, but the problem was solved at the UPS intermediate, you can reset the shutdown with the function „Send RCCMD cancel shutdown". The client, which received the shutdown, will be encouraged to reset it.

This command can be set individually into your CS121, UPSMAN or BACS WEBMANAGER Events/Alarms configuration, but makes sense only, if the event, which will send the command, is true, if the UPS is back in normal condition. For this the events „POWER RESTORED", „BATTERY LOW OFF", „UPSMAN STARTED" and „GENERAL ALARM OFF" are suitable, if they are provided from your UPS into the CS121. The job „Send RCCMD cancel shutdown" would be set into these all-clear events, so that e. g. at restart of the UPS, the event „UPSMAN STARTED" would reset the accordant RCCMD client automatically.

Alternative: Should the job „Send RCCMD cancel shutdown" not be present into your CS121, UPSMAN or BACS WEBMANAGER, you can use the job „Send RCCMD shutdown to remote client" or rather „Send RCCMD execute to remote client" alternatively.

The parameter „WAKEUP“ got the same function like the „Send RCCMD cancel shutdown“ and resets the redundancy alarm of a RCCMD Client into initial state. For this the events „POWER RESTORED“, „BATTERY LOW OFF“, „UPSMAN STARTED“ and „GENERAL ALARM OFF“ are suitable too, to configure the function „Send RCCMD command to remote client“ with the „WAKEUP“ command.

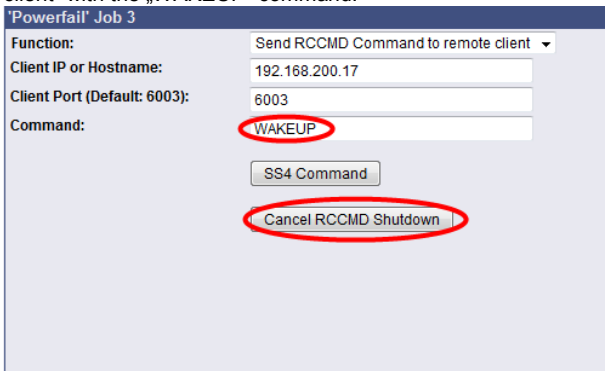


Figure 50: HTTP – Job Editor RCCMD WAKEUP

Click into the CS121 menu “Events/Alarms” onto “Power restored” and add a new job. Select the function “Send RCCMD command to remote client”, set the accordant IP address of the RCCMD client and click the “Cancel RCCMD Shutdown” button.

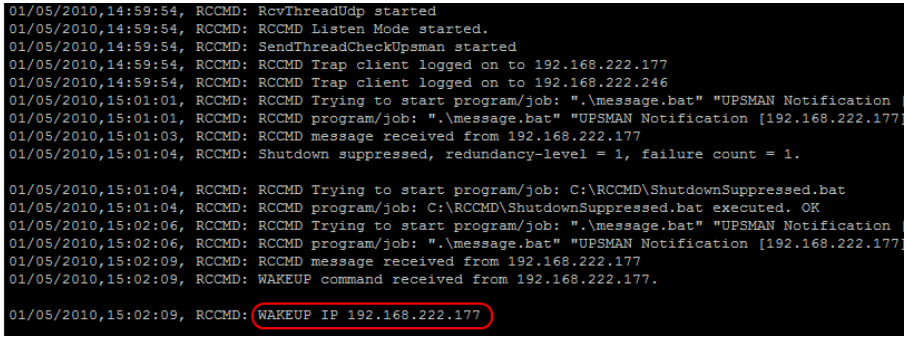

01/05/2010,14:59:54, RCCMD: RcvThreadUdp started
01/05/2010,14:59:54, RCCMD: RCCMD Listen Mode started.
01/05/2010,14:59:54, RCCMD: SendThreadCheckUpsman started
01/05/2010,14:59:54, RCCMD: RCCMD Trap client logged on to 192.168.222.177
01/05/2010,14:59:54, RCCMD: RCCMD Trap client logged on to 192.168.222.246
01/05/2010,15:01:01, RCCMD: RCCMD Trying to start program/job: ".\message.bat" "UPSMAN Notification
01/05/2010,15:01:01, RCCMD: RCCMD program/job: ".\message.bat" "UPSMAN Notification [192.168.222.177]
01/05/2010,15:01:03, RCCMD: RCCMD message received from 192.168.222.177
01/05/2010,15:01:04, RCCMD: Shutdown suppressed, redundancy-level = 1, failure count = 1.
01/05/2010,15:01:04, RCCMD: RCCMD Trying to start program/job: C:\RCCMD\ShutdownSuppressed.bat
01/05/2010,15:01:04, RCCMD: RCCMD program/job: C:\RCCMD\ShutdownSuppressed.bat executed. OK
01/05/2010,15:02:06, RCCMD: RCCMD Trying to start program/job: ".\message.bat" "UPSMAN Notification
01/05/2010,15:02:06, RCCMD: RCCMD program/job: ".\message.bat" "UPSMAN Notification [192.168.222.177]
01/05/2010,15:02:09, RCCMD: RCCMD message received from 192.168.222.177
01/05/2010,15:02:09, RCCMD: WAKEUP command received from 192.168.222.177.
01/05/2010,15:02:09, RCCMD: WAKEUP IP 192.168.222.177

Figure 51: HTTP – Job Editor RCCMD WAKEUP

RCCMD Message

With this job the user can combine and configure a text message with RCCMD event. Text messages can be sent to RCCMD receivers. This makes it possible to send text messages via RCCMD (version 2 or higher) to a Windows 2000 server or a Unix computer, using the “NET SEND” or the respective “WALL” method. The problem with notifying network users on different operating systems is therefore solved.

Note: The corresponding RCCMD clients must be running with RCCMD version 2. RCCMD version 1 can only execute e.g. a shutdown as more than one action are not supported by version 1. Please contact your UPS dealer if you want to use these functions.

3.2.12.1.3 RCCMD Execute/command

This RCCMD signal will cause any RCCMD receiver (e.g. another CS121, RCCMD client or SITEMANAGER, SITESWITCH4) to execute a command or program.

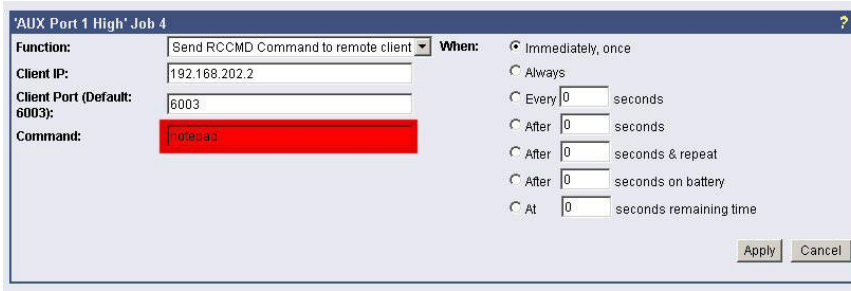


Figure 52: HTTP - Job Editor: RCCMD execute/command

Any CS121, SITEMANAGER, SITESWITCH can also act as an RCCMD listener; see the following examples:

3.2.12.1.4 Example of use 1: CS121-adapter as RCCMD-listener

If it is necessary to execute a command with parameters or a user defined script then these commands must be prepared as an executable batch on the RCCMD client.

The following example toggles the state of AUX output port 2 to high. To ensure that the above command works with a CS121 as RCCMD client the following four criteria must be met:

- Enable RCCMD Listener and set RCCMD Listener Port in menu “Network & Security”.
- Add IP of UPSMAN sender in the SNMP community of the CS121-RCCMD client (see also section “SNMP”)
- Target AUX port must be set to "use as Output" (menu AUX, see according section)
- The send RCCMD Command must match the settings of the CS121 RCCMD listener client.

See the UPSMAN User Manual for setting up this job on a computer running UPS Management Software.

3.2.12.1.5 Example of use 2: CS121-adapter switches an output

CS121 receives an external RCCMD signal to switch an output at the SS4 (Power Switch) which is connected to the AUX of a CS121.

If you want to send from a CS121, UPSMAN, SITEMANAGER II, SITEMONITOR II, SITESWITCH 4 or any other RCCMD sender a signal to any other RCCMD client e.g. to switch at its AUX port an output, please follow the example below.

Note: To let the receiver act as RCCMD listener, same basic settings in menu “Network & Security” are necessary: Please ensure that the option “RCCMD Listener” is enabled and the RCCMD Listener port is specified. (Usually the listener port is 6002)

Figure 53: HTTP – Enable RCCMD Listener

Generally there are 3 commands which can be transmitted from any RCCMD Sender:

Switch Output (AUX): Syntax „|UPSCMD|20000|x,y“
where “x” is the port number from 1-8 (4 ports for CS121 AUX, SENSORMANAGER and SITESWITCH and there are 8 ports for the SITEMANAGER)

y=1 => switch on
y=0 => switch off

“20000” is the command to switch outputs. (for other commands please contact GENEREX support)

Syntax examples:

```
|UPSCMD|20000|1,1  =  Output 1 on
|UPSCMD|20000|1,0  =  Output 1 off
|UPSCMD|20000|2,1  =  Output 2 on
|UPSCMD|20000|8,0  =  Output 8 off
```

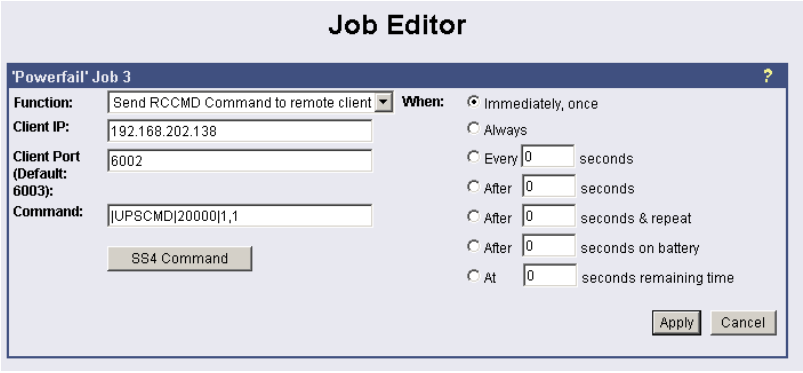


Figure 54: HTTP - Job Editor: RCCMD-Command

If you want to send a signal from a RCCMD client, e.g. UPSMAN or RCCMD Software, to switch an AUX port of a CS121, do the following:

```
C:\RCCMD\

rccmd -se "EXECUTE |AUX|1|1" -s -a 192.168.202.165 -p 6002
```

ATTENTION! The blank after the “Execute” is important!

Common syntax for the switching of AUX ports:

```
|AUX|1|0  Port1, set to low
|AUX|1|1  Port1, set to high
|AUX|2|0  Port2, set to low
|AUX|2|1  Port2, set to high
|AUX|3|0  Port3, set to low
|AUX|3|1  Port3, set to high
|AUX|4|0  Port4, set to low
|AUX|4|1  Port4, set to high
```

- **Confirm a digital alarm :** You can also use this syntax to e.g. confirm alarms for digital inputs (e.g. Fire-alarm, door open, air-condition failed, etc.) which you see in the UNMS software as “New Alarm”. E.g. if your UNMS software shows an active alarm and you want to “acknowledge” this alarm by a switch witch you connected to a CS121 or SITEMANAGER, than you can use the following syntax to program your device to send an “ACK” signal to the receiver. After this your UNMS will show “Alarm acknowledged – recovery action in progress”.

Syntax : |UPSCMD|20001|x
where x is the Portnr. (1-8). („20001“ is the ACK command for digital signals)
Syntax example: `|UPSCMD|20001|2`
This command confirms the Digital-Alarm 2 on a SITEMANAGER, SITEMONITOR, SITESWITCH or CS121 AUX Inputs.

• **Confirm Analog-Alarm :** The way it works with the ACK of analog alarms like Temperature thresholds exceed on the UNMS.

Syntax : |UPSCMD|20002|x
where x is the Portnr. (1-8). („20002“ is the ACK command for for analog signals)
Syntax example: `|UPSCMD|20001|4`
This command confirms the Analog-Alarm 4 on a SITEMANAGER, SITEMONITOR, SITESWITCH or CS121 AUX Inputs.

3.2.12.1.6 RCCMD Trap

RCCMD Trap is the automatic messaging system of CS121, working with RCCMD clients. If jobs have been configured in this category, the actions that are set here will be executed only when an RCCMD client has established a connection to the UPSMON server of the CS121.

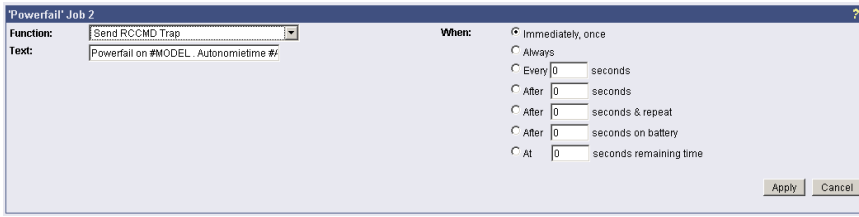


Figure 55: HTTP - Job Editor: RCCMD-Trap

3.2.12.2 UPS shutdown

This event action enables an UPS shutdown. It is possible to configure when to send a shutdown signal to the UPS in case of an e.g. battery low, firealarm or if a complete power down is wanted. Attention: This command will cut off the power supply – only for UPS which support this function!

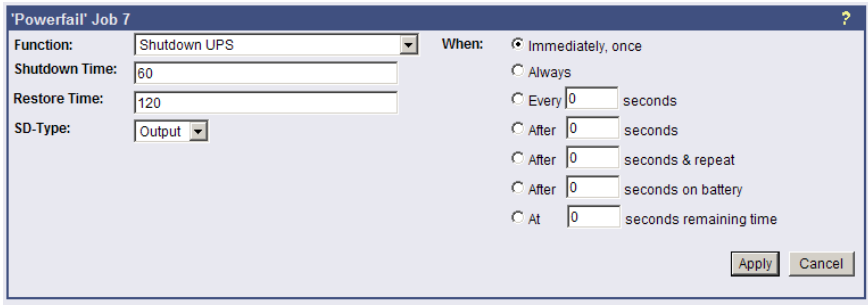


Figure 56: HTTP - Job Editor: Shutdown UPS-Job

The example above configures that 60 seconds after the event powerfail has occurred, the UPS is initiating a shutdown and the UPS waits another 120 seconds after the event powerfail is gone (power restored), before the UPS start up is initiated.

3.2.12.3 AUX-Port

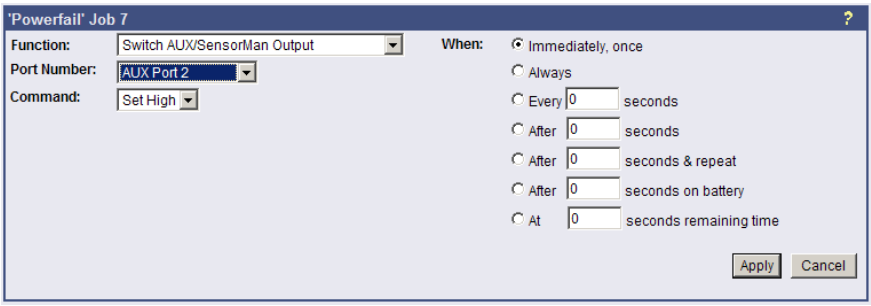


Figure 57: HTTP - Job Editor: Switch AUX-Port

In general, the AUX port is used for auxiliary contacts that can be configured to function as either an Input or an Output. (e.g. as input for Air-conditioning alarm contacts and as Output to switch on electrical sockets or start Beepers etc.) When these contacts are set as Inputs, they are to be treated as an event in the „Events settings“-menu. Reverse, the AUX contacts to be treated as actions when they are being used as Outputs. The AUX port is also used for connecting an SS4/AUX power outlet manager, in which case all AUX ports function as Outputs. For the AUX we provide several “add-ons” like the SS4AUX, SM_IO Relay box, SM_BUZZ Alarm beeper, etc. For a complete overview of “add-ons” for the AUX please see the according datasheet, downloadable from www.generex.de.

The CS121 L (external box) allotted from serial number 0121-10417 (delivered from 31.07.2008) about a COM3 port. The CS121 SC (slot card) allotted from serial number 0123-09428 (delivered from 03.09.2008) about a COM3 port too. The AUX port assignment is depending to the hardwaretype different, see figure 71 and 76.

3.2.12.4 Wake on LAN (WOL)

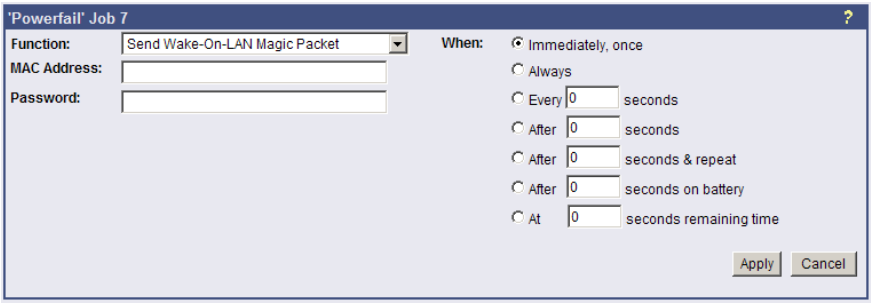


Figure 58: HTTP - Job Editor: Wake on LAN

WOL stands for “Wake on LAN”. This function uses data packages to prompt other computers in a local network to start-up. Please use this function in the event “UPSMAN started” to wake up computers which have been shutdowned previously after an extended poweroutage, which cause the CS121 or UPS to switch off completey. Additional you may add this WOL signal to the EVENT “Power restored”.

Note: Not all network cards support this function, and for those network cards that do, some of them are password protected. Please enable this function on your computers BIOS settings on the motherboard.

Attention: If you want to send WOL signals into different subnets, it is required, that the switch, the PC and the CS121 are configured to “Autosensing”!

3.2.13 Scheduled Actions

This menu is for programming schedules actions on your CS121 or facility manager SITEMANAGER. When combined with the other facility managing functions of the CS121 adapter, the Scheduled actions tool can be used to operate and run many different tasks, e.g. Switch on/off UPS, do battery tests, switch to “green mode” or bypass, etc.

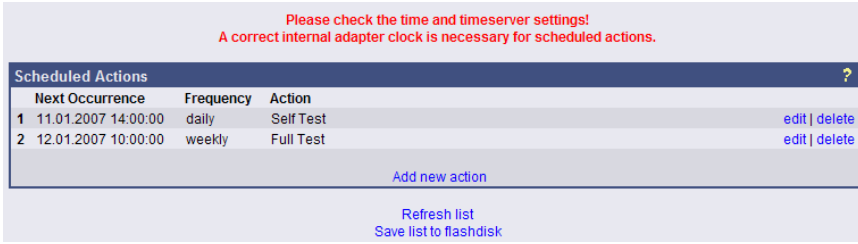

Please check the time and timeserver settings!
A correct internal adapter clock is necessary for scheduled actions.
Scheduled Actions
Next Occurrence
Frequency
Action
1 11.01.2007 14:00:00 daily Self Test edit | delete
2 12.01.2007 10:00:00 weekly Full Test edit | delete
Add new action
Refresh list
Save list to flashdisk

Figure 59: HTTP - Scheduled Actions with warning

After pressing the “new”-button a configuration window will be opened for the making of new entries into the scheduled events of the adapter. This is a very dynamic and versatile configuration window that automatically readjusts itself to adapt to the selected job. Just select a different type of Action and see how the configuration window changes. This makes it very easy for the user to configure the individual jobs. In addition, the window makes the scheduling of reoccurring events very easy by offering the selection of ONCE, DAILY, WEEKLY, and MONTHLY for each new entry.

Note: Please ensure that timeserver settings are valid when you configure scheduled actions. An unreachable timeservice will be indicated at the top of the menu “Scheduled Actions”.

3.2.14 SNMP

Within this menu you can define access controls for SNMP-communities. This concern e.g. SNMP-Management tools, Trap receivers etc.

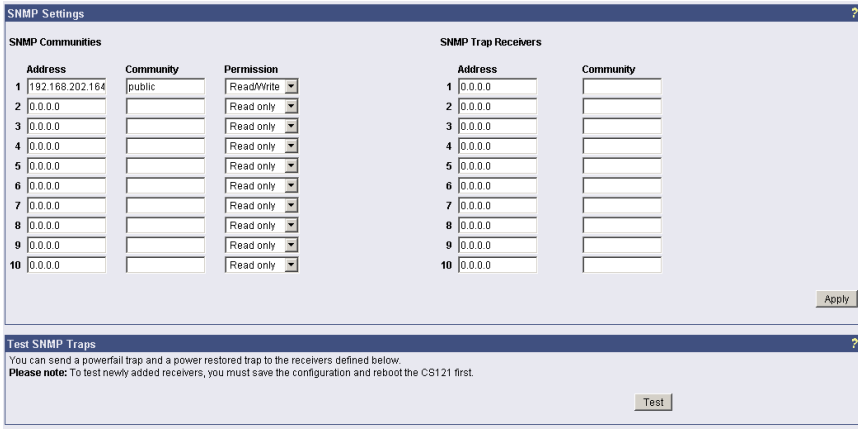


Figure 60: HTTP - SNMP

- **Network Server Settings**

The user may activate or deactivate different options from this menu. Telnet and or SNMP may be switched on or off and the UPSMON access can be blocked. The network speed can also be selected and the user can select and adjust the desired security level.

Note: Please ensure that in the menu “Network & Security” the option “SNMP Agent” is enabled. SNMP Traps have nothing to do with RCCMD traps or the RCCMD shutdown functions. RCCMD works independent from SNMP.

The submenu displays a column of 10 manager IP-addresses with the corresponding access permission, the commands and an example. Use this screen to specify which managers have access to the SNMP adapter agent, the community names (password) and also what type of access the IP managers have - read only or read and write.

- **Configuring Trap-receivers**

Use this to determine which IP managers receive traps (messages) from your SNMP-adapter. The screen permits you to send traps about your UPS to IP-addresses (managers).

Also, the menu for switching authentication and cold boot traps are located here. If activated these traps are send to the configured SNMP trap receivers in the trap receiver list.

- **SNMP Trap Test**

In this menu the user may test the SNMP traps, whereas the defined traps are only used for test purposes and do not represent real traps. The receiver must also be configured in order to make this test work. Additionally, save the settings and reboot your CS121 before testing the communication with the configured IP-address. (does not work in configuration mode). If you use SNMP Test trap, you will receive SNMP Traps of a “Powerfail” and “Power restored “ scenario – the simulation of a power outage of some seconds.

See also Network & Security-Settings.

3.2.15 COM2 & AUX

3.2.15.1 COM2

This menu takes the user into the submenus for the general settings of the COM2 and AUX connection ports of the CS121-adapter.

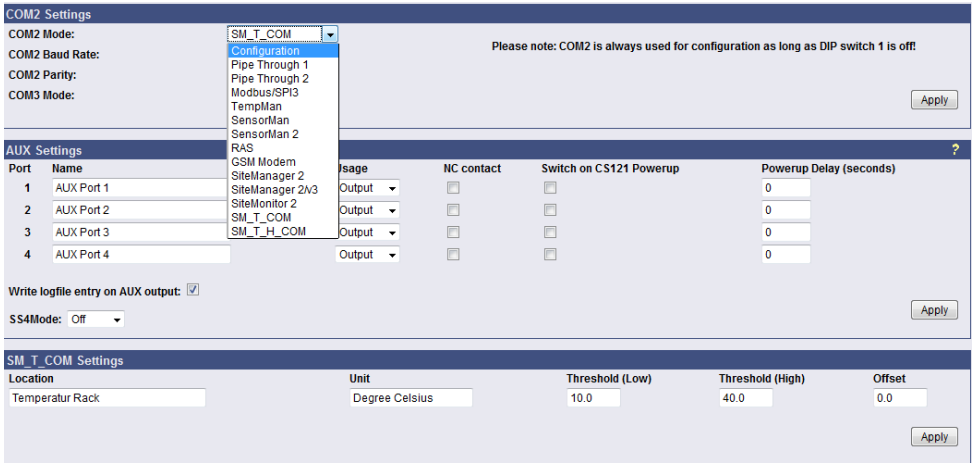


Figure 61: HTTP - COM2 Mode overview

- **Configuration Mode**:

This sets the normal configuration mode for using the provided cable (CS121-TEMP configuration cable).

Note: Unless DIP-switch 1 is OFF the COM2 port is always running in configuration mode.

- **Pipe-Through Mode 1**:

Enable or disable the “pipe-through” of the adapter. If enabled, the RS-232 protocol of the UPS will be transmitted to the COM2 of the adapter, so now you can connect any other RS-232 software to the adapter to make use of the RS-232 UPS protocol – parallel to the adapter. This makes the use of multiplexer hardware is no longer necessary. 2 serial interfaces on your UPS which are working parallel are utilized now. Reminder: If you have enabled this function, you can no longer configure the adapter via the serial cable, you must changed the settings via HTTP. As communication cable between CS121 and your application you have to use the original CS121 configuration cable.

- **Pipe-Through Mode 2**:

Analog to Pipe-through mode 1, the UPS data is piped through to COM2 but not directly. In order to accelerate the internal processes of the adapter, the UPS data is accumulated into memory before being made available to COM2. Consequently, Pipe-through mode 2 also does not provide for the relaying of signals to the UPS through COM2 either. (See also section “Network & Security Settings”)

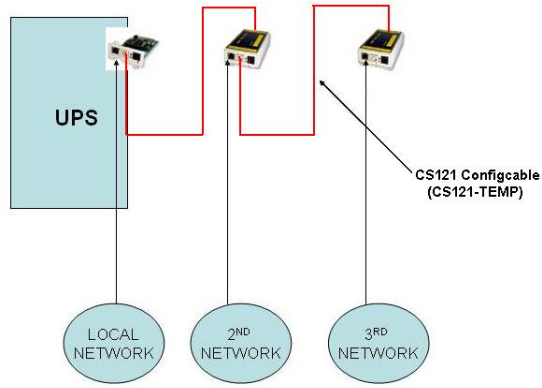


Figure 62: Pipe Thru Installation

- **MODBUS/SPI3**

The selection of MODBUS/SPI3 in the drop down menu of the COM2 settings enables the CS121 MODBUS/SPI3-Profibus function. The default CS121 device types communicating MODBUS via RS232. The special CS121 device types LM and SCM communicating RS485 via the COM2. You can detect by means of the CS121 serial number 0124-..., if you got a CS121 with RS485 interface. The CS121_SPI3 Profibus and LONBUS converters will be connected to the COM2 with RS232 port and as configuration use MODBUS/SPI3.Please take a look into chapter 6.7 for further information.

- **TEMPMAN & SENSORMANAGER I & II**:

The TEMPMAN and SENSORMANAGER are extensions to the CS121 that connect to COM2 of the adapter. The newer of the two products is the SensorManager. These devices are simply plugged into the CS121 for setup and the only mandatory change on the adapter to enable this functioning is to set the COM2 Settings to either TEMPMAN or SENSORMAN. The configuration is easily achieved via the HTML page of the CS121 web server. Please note the drop-down menu and entry fields on the page. (see screenshot above) For in-depth SENSORMANAGER settings see following up chapter.

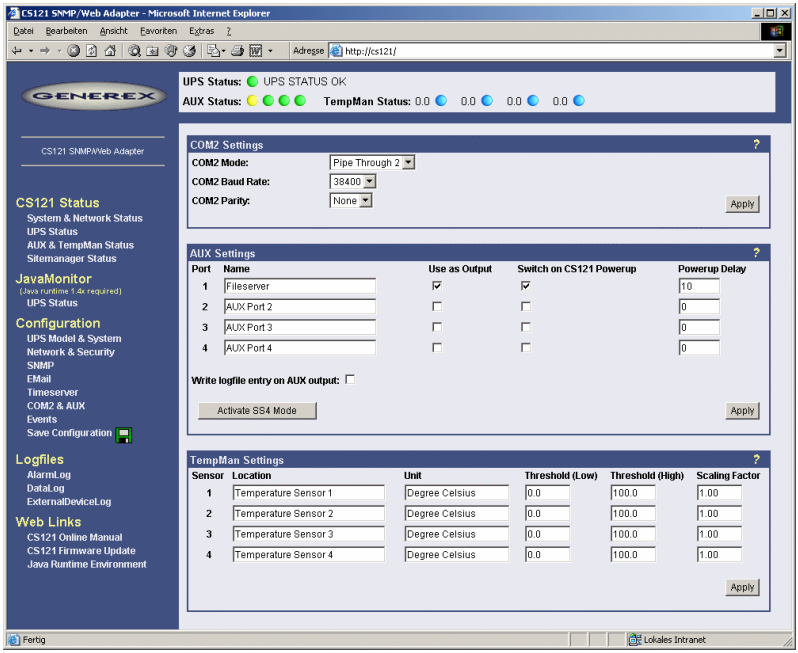


Figure 63: HTTP - COM2 & AUX with TEMPMAN

- **RAS-Mode**

The selection of the “RAS”-entry in the drop down menu of the COM2 settings enables the CS121-RASManager function. This function is only operational if a RASMANAGER ist used (CS121 with inbuilt modem) and a RASMANAGER license key is provided (optional, part of RASMANAGER). While it is also possible to select this entry in the Telnet menu, it is only possible to configure the RASMANAGER settings using the HTTP interface of the CS121. See menu “RAS Configuration” for further settings.

- **GSM Modem**

A GSM modem provides the notification or rather forwarding of the UPS events/alarms via SMS. Please take a look into chapter 6.5 for further information.

- **SiteManager 2, SiteManager 2/v3**

The selection of SiteManager 2, SiteManager 2/v3 enables the communication between the CS121 and the SiteManager. The SiteManager is a professional facility management device, which provides 8 configurable analog inputs, 8 digital inputs and 8 switchable relay contacts. Please take a look into the SiteManager II user manual for further information.

- **SiteMonitor 2**

The COM2 selection SiteMonitor 2 enables the communication between the CS121 and the SiteMonitor 2. The SiteMonitor 2 is a professional facility management device, which provides 64 digital inputs for several contact detectors.

- **SM_T_COM**

The SM_T_COM is a temperature sensor for the CS121 and is used for the monitoring and controlling of UPS rooms, server rooms etc.. Please take a look into chapter 6.2 for further information.

- **SM_T_H_COM**

The SM_T_H_COM is a temperature and humidity sensor for the CS121 and is used for the monitoring and controlling of UPS rooms, server rooms etc.. Please take a look into the SM_T_H_COM datasheet for further information.

3.2.15.2 AUX and SITESWITCH4 Settings

The AUX connection is an input/output port for connecting external contact devices such as alarms or for connecting to an SS4AUX SiteSwitch power socket manager. The SS4 SiteSwitch is a standalone device with a built in CS121. The SiteSwitch SS4 AUX is an inexpensive and practical extension to the CS121 adapters enabling the individual power switching of up to four power sockets – using the inbuilt AUX port (4 pins) of the CS121. By entering the corresponding list number, the AUX ports are switched to output or input.

The AUX port can only read signals, if the port is switched to input. If switched to output the AUX port can send signals to an optocoupler for example. (Refer to the circuit diagrams in the appendix.) After a reboot, the state of the switches remains in the status previous to the reboot.

The following describes the configuration of the AUX ports using the HTML interface. All of the AUX ports 1 – 4 can be manually set to „Output“ so that in the event of an alarm, the CS121 can be preconfigured in the “Events” menu to switch the ports individually. When all ports are set to “Output”, this is equivalent to activating the „SS4 Mode“. The SS4 mode is to be activated when connecting a SITESWITCH4 to the AUX port of the CS121.

When the Output options are deactivated, the AUX ports act as inputs used for monitoring signals such as input from alarm contacts. For example, while configuring port 2 as an input to monitor an alarm, the CS121 can also be preconfigured to respond to the alarm signal from port 2 to shut on or off a device connected to one of the other ports that has been set to Output.

For example see also the settings in figure “HTTP - COM2 & AUX” above.

The OUTPUT setting is to be configured with a power-up sequence so that, for example the fileserver on port 1 will be switched on upon Power up. In the Power up delay-fields the number of seconds after a Power up in which a connected port device is to be switched on can be entered. E.g. the setting 10 in the Power delay column will cause the switching on of the fileserver on Port 1 to be delayed by 10 seconds after the Power up. Note that executing the Save, Exit & Reboot does not cause a Power up, in order to cause a Power up the power supply to the adapter must be interrupted. The differences between a Reboot and a Power up become more noticeable when considering the AUX port contacts. During a Reboot the current status of the ports remain unchanged unless the settings of the ports have been changed from input to output or vice versa. A Power up will set the ports to the preconfigured Power up settings.

Note: From CS121 HW131 it is required, if the AUX ports will be defined from “Unused” to In- or rather Output, that a cable with Pull-Down resistance or a CON-AUX or a CON-R-AUX is connected. Otherwise the status display of the AUX ports is undefined and can be changed by itself anytime !

3.2.16 SENSORMANAGER

The SENSORMANAGER is a data measurement and collecting unit which allows the individual measurement and monitoring of 8 analog measurement devices (0-10V) and 4 digital alarm inputs or 4 outputs (open collectors). SENSORMANAGER has its own chapter in the manual, wherein the features and field of applications etc. pp. are described as well as in depth the various specific configurations.

In generally, the SENSORMANAGER unit is connected with its COM 1 port to CS121’s COM 2 port, which has to be configurated as SensorManager mode (see also section COM 2 settings above).

Within the configuration page “Sensor Manager Settings” of the CS121 you can - among others - define limit values when events (to be configurated in “Events / Alarms”) will be released.

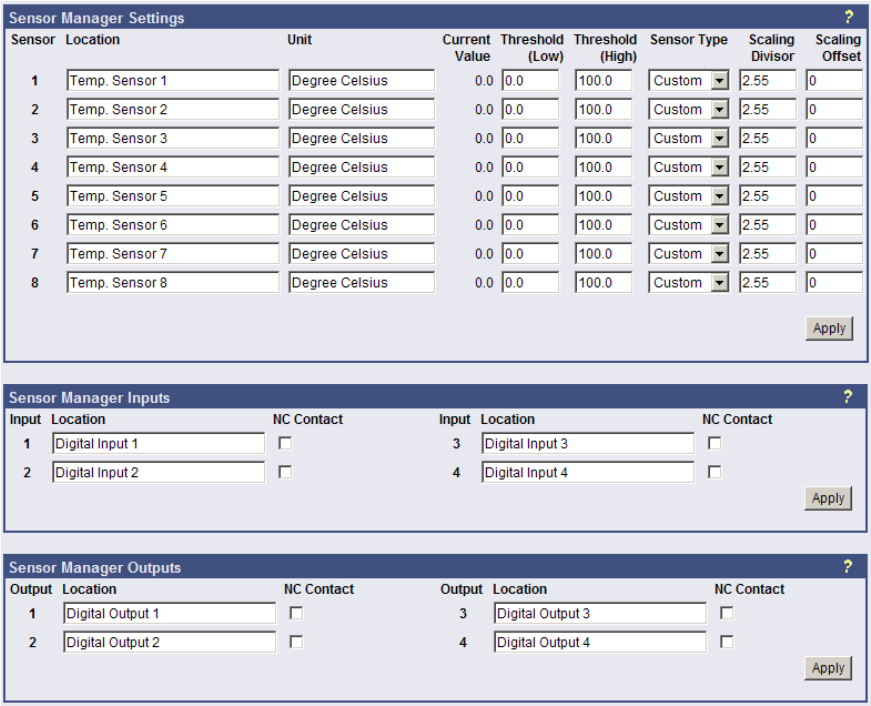

Sensor Manager Settings
Sensor Location Unit Current Value Threshold (Low) Threshold (High) Sensor Type Scaling Divisor Scaling Offset
1 Temp. Sensor 1 Degree Celsius 0.0 0.0 100.0 Custom 2.55 0
2 Temp. Sensor 2 Degree Celsius 0.0 0.0 100.0 Custom 2.55 0
3 Temp. Sensor 3 Degree Celsius 0.0 0.0 100.0 Custom 2.55 0
4 Temp. Sensor 4 Degree Celsius 0.0 0.0 100.0 Custom 2.55 0
5 Temp. Sensor 5 Degree Celsius 0.0 0.0 100.0 Custom 2.55 0
6 Temp. Sensor 6 Degree Celsius 0.0 0.0 100.0 Custom 2.55 0
7 Temp. Sensor 7 Degree Celsius 0.0 0.0 100.0 Custom 2.55 0
8 Temp. Sensor 8 Degree Celsius 0.0 0.0 100.0 Custom 2.55 0
Apply
Sensor Manager Inputs
Input Location NC Contact Input Location NC Contact
1 Digital Input 1 3 Digital Input 3
2 Digital Input 2 4 Digital Input 4
Apply
Sensor Manager Outputs
Output Location NC Contact Output Location NC Contact
1 Digital Output 1 3 Digital Output 3
2 Digital Output 2 4 Digital Output 4
Apply

Figure 64: HTTP – Sensor Manager Settings

Please see SensorMan in section “Accessories” of this manual.

3.2.17 RAS Configuration

This is the standard setting for the RASManager, the CS121 with the built-in modem. Most of the CS121 products can also have the RASManager feature enabled by purchasing PPP License Key and by connecting a supported modem. The RASManager and RASControl software come with an extra user manual for describing this feature.

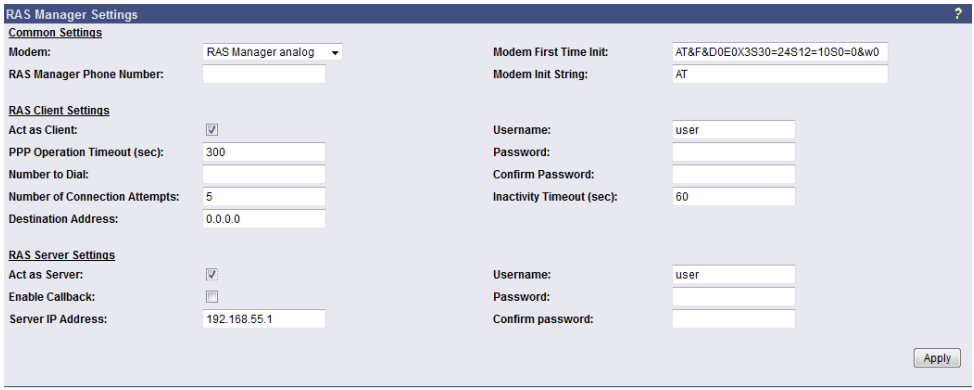


Figure 65: HTTP - RAS Manager Settings

3.2.18 Save Configuration / Reboot

If you are satisfied with your configuration select “Save, Exit & Reboot” and wait until the adapter informs you about the reboot-process.

Please notice that a reboot of the CS121 may take up to 3 minutes. During the boot phase the CS121 is compiling the user settings and waits for timeserver response. As soon as the start-up process is through and all requested data are present or „timed-out“, the UPS communication starts and the green LED is flashing to signalize the UPS RS-232 traffic. Now the device is ready for use and you may check the UPS values with any Web browser (http::/<IP address>) or SNMP software - or you may connect with Datawatch Pro-tools, such as UPSMON, UNMS, USW or JAVAMON. When connecting with UPSMON or UNMS, TCP/IP can be selected instead of SNMP. This is faster and contains more UPS values than an SNMP communication.

3.3 Reading the Logfiles

The CS121-Alarmlog contains the alarm protocol of events that were designated as alarms in the Event/Settings-section and include the user defined alarm settings of the CS121 configuration as well as the events that are designated as alarms in the UPS native protocol. These entries include such things as CS121 Admin defined email notifications which lead to a much higher alarm entry log level than would otherwise be the case if only UPS protocol defined alarms were being recorded. For explanation, the following illustrates typical log file entries made by the UPS:

The CS121 logs the time after a new start up:

```
01/17/2007,16:21:45, Synchronized with timeserver 192.53.103.103. OK
```

This indicates a successful synchronization with the timeserver.

```
01/17/2007,16:23:39, UPSMAN <UPS model> has started
```

UPS communication functions and device is in normal operation mode. This is the standard entry after every successful reboot of a CS121.

(The following entries result only from user defined settings as with the CS121 ADMINSTRATOR EMAIL Settings.)

```
01/17/2007,16:28:39, MAIL: subject "CS121 Event 4" successfully sent.
```

All “EVENT X” designated alarms are viewable in the EVENT list of the web browser. EVENT 4 for this particular UPS is the EVENT "UPSMAN started" – This means that an Email was sent with the text "UPSMAN started" which acts to confirm the log entry of 08:06:50 as Email.

```
01/17/2007,16:28:47, MAIL: subject "CS121 Event 16" successfully sent
```

In this case, the Scheduler has been activated and is ready for operations. In this case, the scheduler is set to conduct a "Selftest" which it in turn relays per email to the designated CS121 ADMIN.

```
01/17/2007,16:28:47,MAIL: subject "CS121 Event 26" successfully sent
01/17/2007,16:29:03,MAIL: subject "CS121 Event 27" successfully sent
01/17/2007,16:29:28,MAIL: subject "CS121 Event 28" successfully sent
01/17/2007,16:30:46,MAIL: subject "CS121 Event 29" successfully sent
```

These are 4 Emails indicating the status of the AUX Ports (Auxiliary connection for external alarms), which are set to give notification of the status signal LOW. Since the AUX Status can only be set to High or Low and given that the CS121 in itself cannot distinguish the device, an alarm email will be sent by the CS121 to the designated ADMIN at startup per default with the startup status of each connected alarm. In this case, it is up to the administrator to determine if the emails indicate an actual alarm or not.

```
01/17/2007,16:34:48,MAIL: subject "CS121 Event 38" successfully sent
01/17/2007,16:35:12,MAIL: subject "CS121 Event 39" successfully sent
01/17/2007,16:35:16,MAIL: subject "CS121 Event 40" successfully sent
01/17/2007,16:35:28,MAIL: subject "CS121 Event 41" successfully sent
01/17/2007,16:35:33,MAIL: subject "CS121 Event 42" successfully sent
01/17/2007,16:35:40,MAIL: subject "CS121 Event 43" successfully sent
```

```
01/17/2007,16:35:51,MAIL: subject "CS121 Event 44" successfully sent
01/17/2007,16:35:57,MAIL: subject "CS121 Event 45" successfully sent
```

These are 8 Emails sending information about analogue sensors (temperature, humidity and the like) that are connected to a SENSORMANAGER, indicating that all controlled values are within tolerance levels - or that no sensor is connected to the device or connection port.

```
01/17/2007,16:36:30,MAIL: subject "CS121 Event 54" successfully sent
01/17/2007,16:36:41,MAIL: subject "CS121 Event 55" successfully sent
01/17/2007,16:36:48,MAIL: subject "CS121 Event 56" successfully sent
01/17/2007,16:36:57,MAIL: subject "CS121 Event 57" successfully sent
```

These 4 Emails indicate that the digital sensors (for airconditioning, fire alarms and the like) of the SENSORMANAGER, are either in the normal state or that no sensor is connected.

```
01/17/2007,17:41:12,MAIL: subject "CS121 Event 62" successfully sent
01/17/2007,17:41:36,MAIL: subject "CS121 Event 63" successfully sent
01/17/2007,17:43:23,MAIL: subject "CS121 Event 64" successfully sent
01/17/2007,17:44:01,MAIL: subject "CS121 Event 65" successfully sent
```

These 4 Emails indicate the status of the digital alarm contacts of the sensors (for Emergency OFF, fire extinguisher and the like) connected with the SENSORMANAGER, showing either the status is NORMAL or that nothing is connected.

```
01/17/2007,17:52:13,MAIL: subject "CS121 Event 70" successfully sent
```

This Email shows that no SENSORMANAGER is connected although the CS121 is configured as having a connection to a Sensormanager. This informs the ADMIN that the CS121 is incorrectly configured. In this case, the user should correct the settings.

The UPS data will be logged with timestamp into the CS121 DataLog.

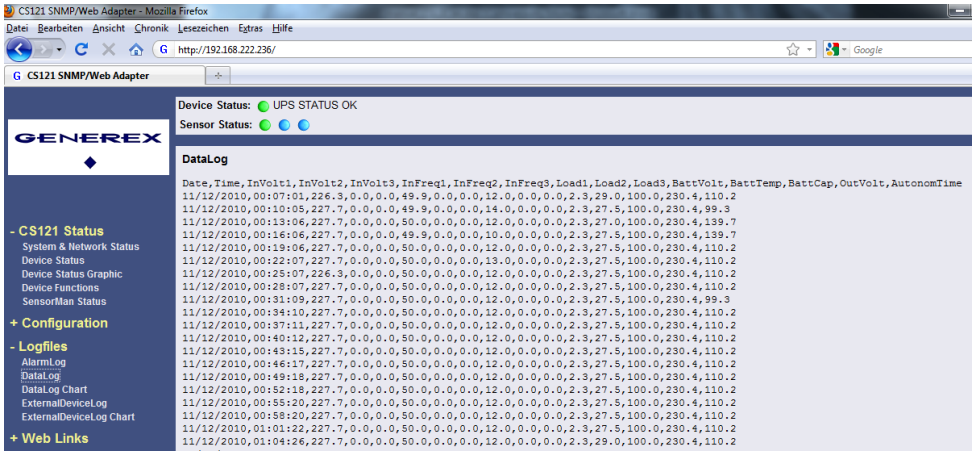


Figure 66: HTTP – CS121 DataLog

The data of the connected devices (e. g. temperature sensor) will be logged into the CS121 ExternalDeviceLog.

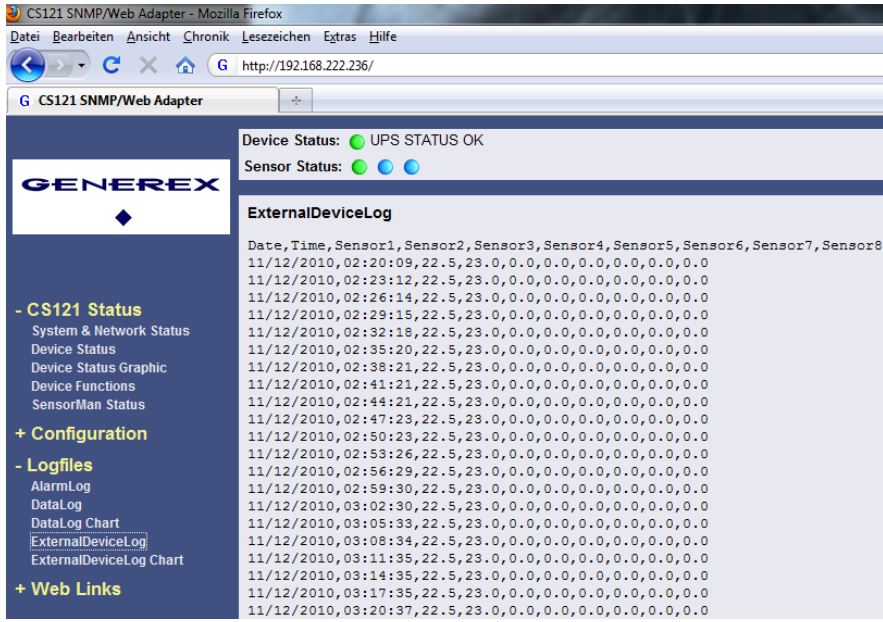


Figure 67: HTTP – CS121 ExternalDeviceLog

In figure 62 the logging of a SM_T_H_COM is displayed, sensor 1 for the temperature, sensor 2 for the humidity.
At unify UPS their events will be imported out of the UPS directly and are displayed into the CS121 menu LogFiles, “UPS Events”.

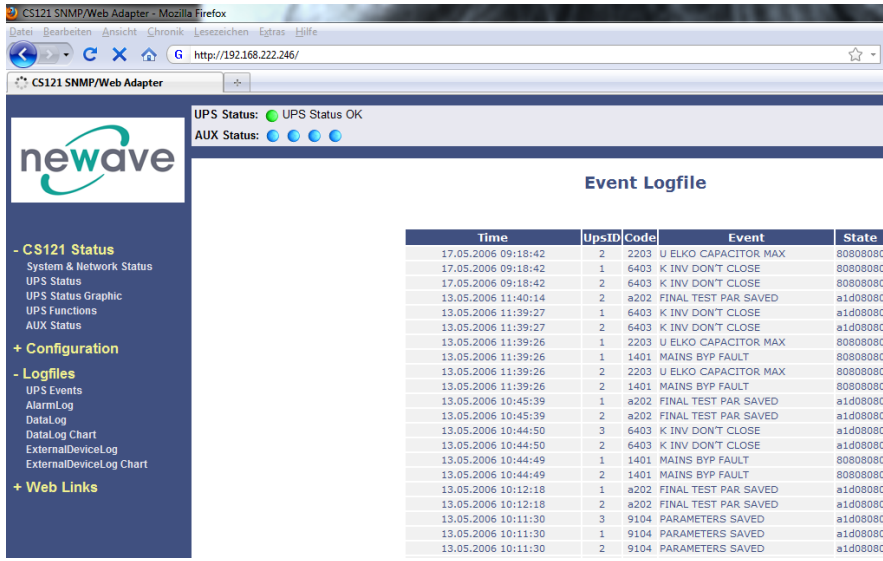

CS121 SNMP/Web Adapter - Mozilla Firefox
Datei Bearbeiten Ansicht Chronik Lesezeichen Extras Hilfe
http://192.168.222.246/
CS121 SNMP/Web Adapter
newave
UPS Status: UPS Status OK
AUX Status:
Event Logfile
Time UpsID Code Event State
17.05.2006 09:18:42 2 2203 U ELKO CAPACITOR MAX 80808080
17.05.2006 09:18:42 1 6403 K INV DON'T CLOSE 80808080
17.05.2006 09:18:42 2 6403 K INV DON'T CLOSE 80808080
13.05.2006 11:40:14 2 a202 FINAL TEST PAR SAVED a1d08080
13.05.2006 11:39:27 1 6403 K INV DON'T CLOSE a1d08080
13.05.2006 11:39:27 2 6403 K INV DON'T CLOSE a1d08080
13.05.2006 11:39:26 1 2203 U ELKO CAPACITOR MAX 80808080
13.05.2006 11:39:26 1 1401 MAINS BYP FAULT 80808080
13.05.2006 11:39:26 2 2203 U ELKO CAPACITOR MAX 80808080
13.05.2006 11:39:26 2 1401 MAINS BYP FAULT 80808080
13.05.2006 10:45:39 1 a202 FINAL TEST PAR SAVED a1d08080
13.05.2006 10:45:39 2 a202 FINAL TEST PAR SAVED a1d08080
13.05.2006 10:44:50 3 6403 K INV DON'T CLOSE a1d08080
13.05.2006 10:44:50 2 6403 K INV DON'T CLOSE a1d08080
13.05.2006 10:44:49 1 1401 MAINS BYP FAULT 80808080
13.05.2006 10:44:49 2 1401 MAINS BYP FAULT 80808080
13.05.2006 10:12:18 1 a202 FINAL TEST PAR SAVED a1d08080
13.05.2006 10:12:18 2 a202 FINAL TEST PAR SAVED a1d08080
13.05.2006 10:11:30 3 9104 PARAMETERS SAVED a1d08080
13.05.2006 10:11:30 1 9104 PARAMETERS SAVED a1d08080
13.05.2006 10:11:30 2 9104 PARAMETERS SAVED a1d08080
- CS121 Status
System & Network Status
UPS Status
UPS Status Graphic
UPS Functions
AUX Status
+ Configuration
- Logfiles
UPS Events
AlarmLog
DataLog
DataLog Chart
ExternalDeviceLog
ExternalDeviceLog Chart
+ Web Links

Figure 68: HTTP – CS121 UPS Events

3.4 CS121 for Transfer Switches

The CS121 is used from time to time for automatic transfer switches (ATS) too. The graphical display depends on the manufacturer.

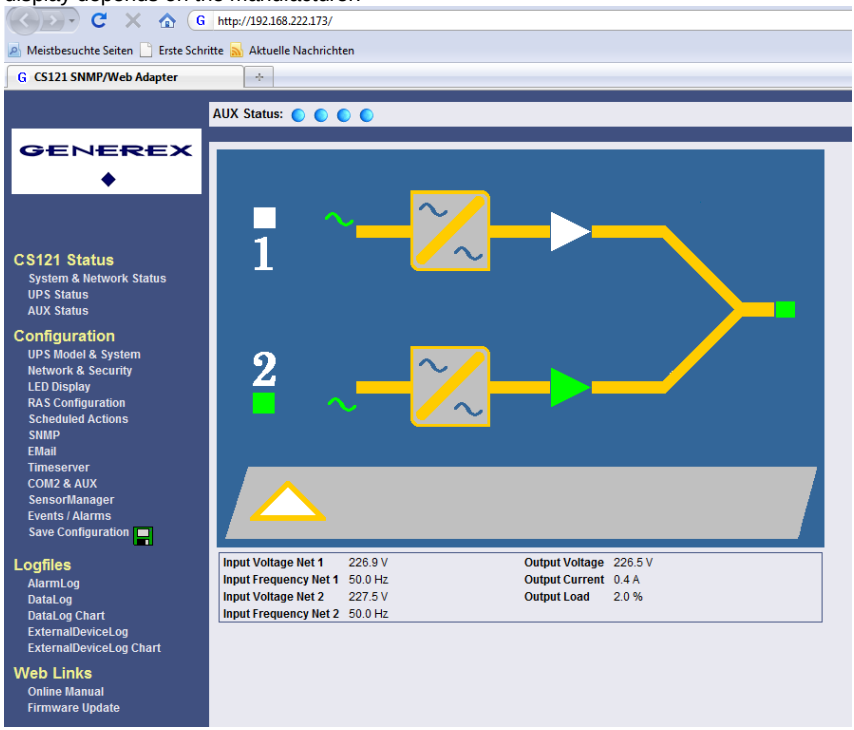


Figure 69: HTTP – Status Page Socomec Transfer Switch

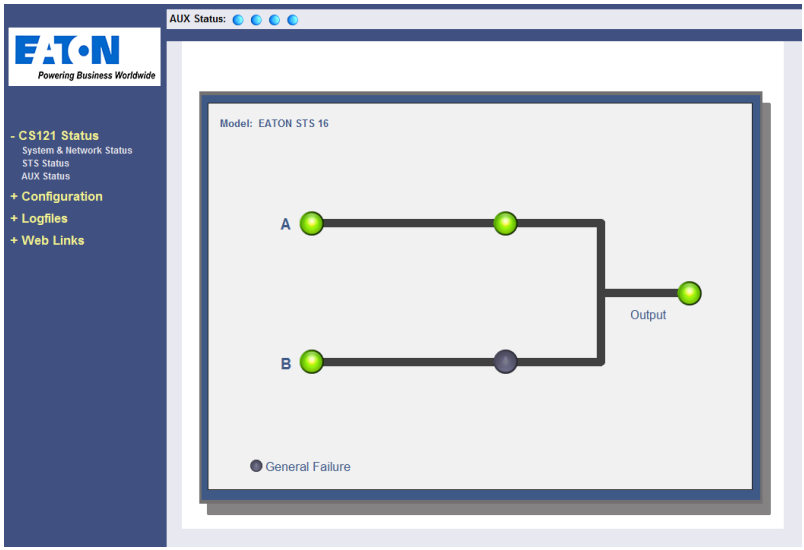


Figure 70: HTTP – Status Page Eaton Transfer Switch

All ASYS, AEG and PILLER transfer switches are using the extended RFC1628 SNMP MIB (Download). The models SOCOMEC STS and LTM got their own MIB (STS LTM MIB), which is available as download from our website:

http://www.generex.de/index.php?option=com_content&task=view&id=63&Itemid=104

4. Adapter Software-Updates (Firmware)

Usually the CS121-Adapter already contains a specified firmware-version and does not need to be updated unless you have problems or you find a update recommendation on our website. (use firmware online update link on CS121 page).

If you have connected your CS121 via LAN a link at the Webbrowser configuration page (CS121 Firmware Update) indicates you with red or green coloured information whether you should perform a Firmware-Update or not.

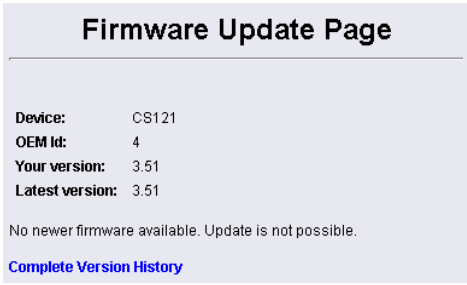


Figure 71: HTTP - Firmware Update Page

Note: We strongly recommend to update any firmware lower than 2.69 to the actual version!

All actual Firmware-updates are provided at www.generex.de download page.

Note: Any interruption of a firmware upload may damage your adapter. If this is the case, you have to reformat the adapter with special software See section “Firmware Recovery”. or contact your UPS software support for more information.

The boot procedure of the CS121-adapter performs several steps:

- First, the firmware is going to be uncompressed.
- Starting firmware
- Control process called UPSMAN is going to be started and USV connection is trying to established
- Services e.g. Webserver etc. started

There are two ways to update your firmware-version, by using the Setup-tool or via FTP.

4.1 Firmwareupdate via Setup-tool

Firmware updates are available for free at www.generex.de. Download the specified version (mind your OEM ID) and follow up the setup-procedure. If necessary, consult your UPS dealer for further information.

4.2 Firmwareupdate via FTP

A firmware update can be made via FTP during normal operation of the CS121-Adapter (username: “admin”, password: “cs121-snmp”). Simply overwrite the older firmware files, PROJECT.HEX, UPSTYP.UPS and MESSAGES.DAT in the FILES folder with the newer files

and reboot the adapter. Afterwards, reconfigure the device via Telnet. For more details read the README.TXT of the firmware update package.

Note: The configuration of the CS121 can be saved for archiving purposes using an ftp-connection. Simply download the „upsman.cfg“ to the directory of your choice. Later on, after the CS121 has been updated, the configuration can be saved back into the „flash“ directory of the CS121 per ftp.

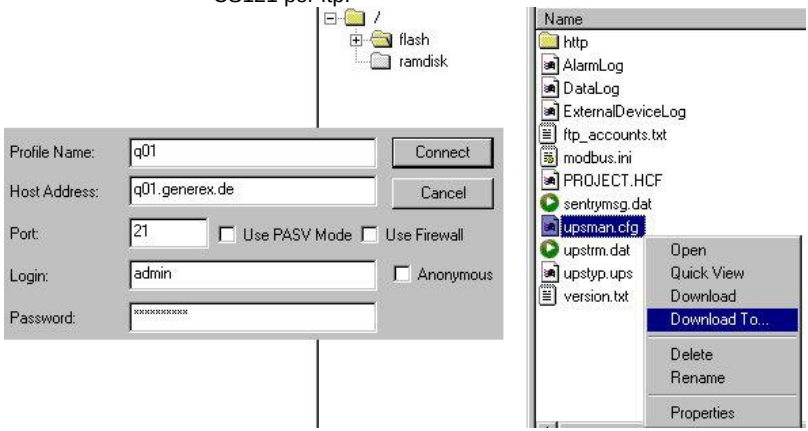


Figure 72: CS121-configuration settings via ftp.

A firmware-update via FTP changes not only the operating system part of the CS121, if you want to change also UPS manufacturers data you have to overwrite also the file UPSTYP.UPS. Please contact your UPS software support for further information.

4.3 Firmware flash renewal and recovery

Caution: This upgrade process requires some technical knowledge. This process can seriously damage your CS121 if not performed correctly. Please follow the instructions carefully to avoid damaging your system! We strongly recommend to use the CS121 update tool to avoid conflicts and to safely update your CS121.

General information regarding the upgrading process of the CS121 - Known Problems and Preliminary Precautions:

- Any update will cause a deletion of all former settings. The adapter must be reconfigured after the update. The current settings information can be saved by using an FTP connection to your adapter to save the upsman.cfg file in the flash directory to a local directory. This file contains all of the information about the current CS121 settings in a formatted text. Do not copy this file back onto the adapter after the update as a replacement for the new upsman.cfg. The information must be entered back into the settings using the adapters configuration interface. Note that the http interface often contains newer settings options that are not yet implemented in the telnet and terminal interfaces.
- Any recovery should be made on the default IP Address 10.10.10.10. Put DIP Switch 1 and 2 in the OFF position before starting.
- Please avoid the use of routers and switches between your computer and the CS121, if available use Hub (recommended) or a direct line (Ethernet-cross-cable).

Instructions for recovery procedure:

In case the CS121 is not running, has any defect or other problem, please put dip switch 1 to OFF (Dip 2 should be always OFF) and follow the procedure below:

1. Before starting the update, unplug the adapter from the power supply (slot cards have to be removed from the slot).

2. Set a route to default IP-Address. Command syntax on your windows computer: "route add 10.10.10.10 <your IP address>". Also note that the flash tool can also be used to set the route for you by checking the set route check box in the update interface.

3. Check if your route is correctly set with the console command "route print". You should see that 10.10.10.10 is in the list.

4. Make sure that no other device is answering on "ping 10.10.10.10". If you get any answer then you have to disable this device first before you can continue.

5. As an extra notice, the update interface displays an stereo button with the text "Format & Rewrite" to show that all settings will be lost.

6. Press the "Start Update" button and re-power the CS121 in **THE EXACT SAME MOMENT**!

If the start was successful, you will see that the firmware is loading. **DO NOT INTERRUPT THIS PROCESS**! Pay attention to the process. If during the loading the following text reappears in the dialogue:

"Connecting to target 10.10.10.10 on port 4000....."

then shortly disrupt the power supply to the adapter in order to initiate the communication call between the updating computer and the adapter once again. The process should then flow through all the way to the following text: "update successful".

Attention: It is important to start the update and the adapter at the same time because even with a defect firmware installation, there is a window of 1 second during the start of a cold boot in which the CS121 will answer IP calls to 10.10.10.10. When the firmware update tool gets a connection during this time, the recovery process can start. If you get a timeout, retry this procedure.

7. After the firmware has been loaded, you can reboot the adapter and configure the system with HTTP (resp. TELNET), still using IP address 10.10.10.10.

4.4 How to get the “upsman.cfg” from a CS121 to your computer via FTP

Click on the web-interface of your CS121 into the configuration menu bar the „Save Configuration“ button. Click the „Backup Configuration“ icon with the right mouse button, select „Save Target As“ and choose the path of your hard disk, where you want to store the „upsman.cfg“ data.

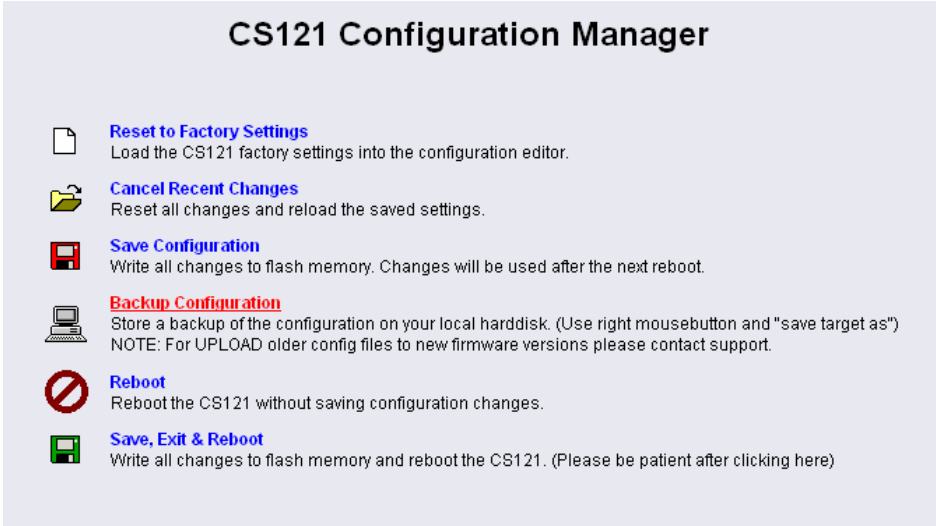

CS121 Configuration Manager
Reset to Factory Settings
Load the CS121 factory settings into the configuration editor.
Cancel Recent Changes
Reset all changes and reload the saved settings.
Save Configuration
Write all changes to flash memory. Changes will be used after the next reboot.
Backup Configuration
Store a backup of the configuration on your local harddisk. (Use right mousebutton and "save target as")
NOTE: For UPLOAD older config files to new firmware versions please contact support.
Reboot
Reboot the CS121 without saving configuration changes.
Save, Exit & Reboot
Write all changes to flash memory and reboot the CS121. (Please be patient after clicking here)

Figure 73: CS121-Configuration Manager

Via FTP: Enter the following into the address field of a web-browser: ftp://<ip-address of your CS121>. Enter the username *admin* and the password *cs121-snmp*. You will find the „upsman.cfg“ into the „flash“ folder.

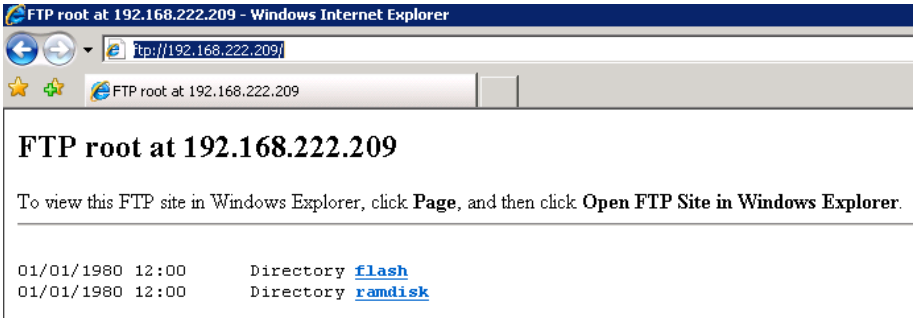

FTP root at 192.168.222.209 - Windows Internet Explorer
ftp://192.168.222.209/
FTP root at 192.168.222.209
FTP root at 192.168.222.209
To view this FTP site in Windows Explorer, click Page, and then click Open FTP Site in Windows Explorer.
01/01/1980 12:00 Directory flash
01/01/1980 12:00 Directory ramdisk

Figure 74: CS121-FTP Access

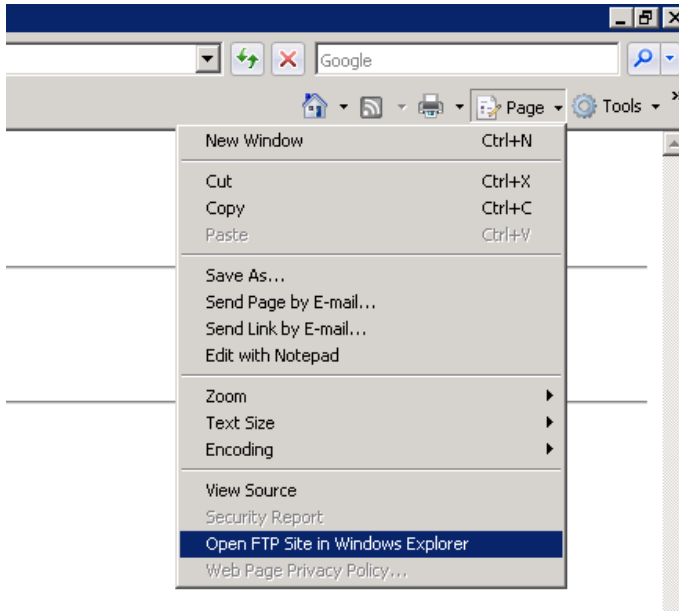


Figure 75: CS121-FTP Context Menu

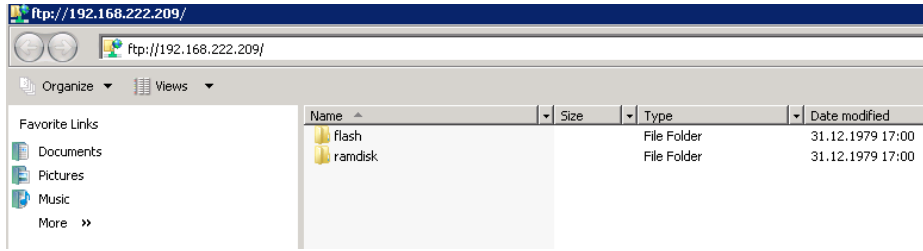


Figure 76: CS121-FTP Folders

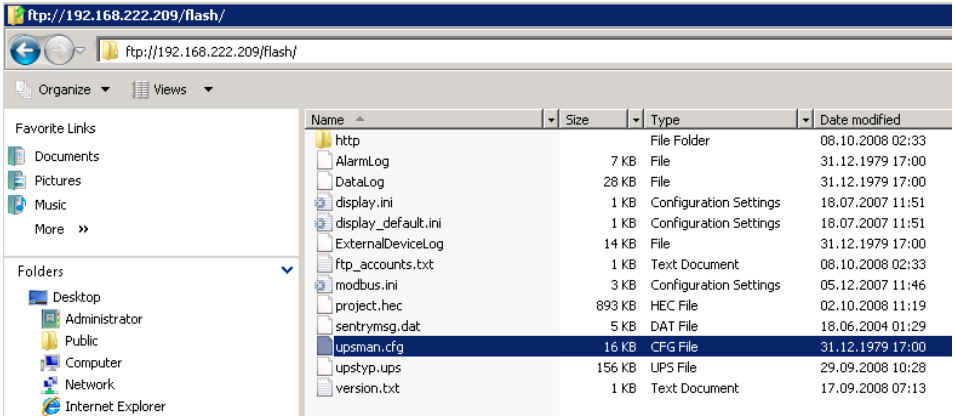


Figure 77: CS121-FTP Upsman.cfg

After you have updated your CS121, please open the „new“ and the stored „upsman.cfg“ in an editor. Now check, if the parameter of the new data are present into the stored data. If not, you **need** to copy the missing parameter of the new data into the stored „upsman.cfg“.

Now you can overwrite the „upsman.cfg“ into the „flash“ folder via ftp.

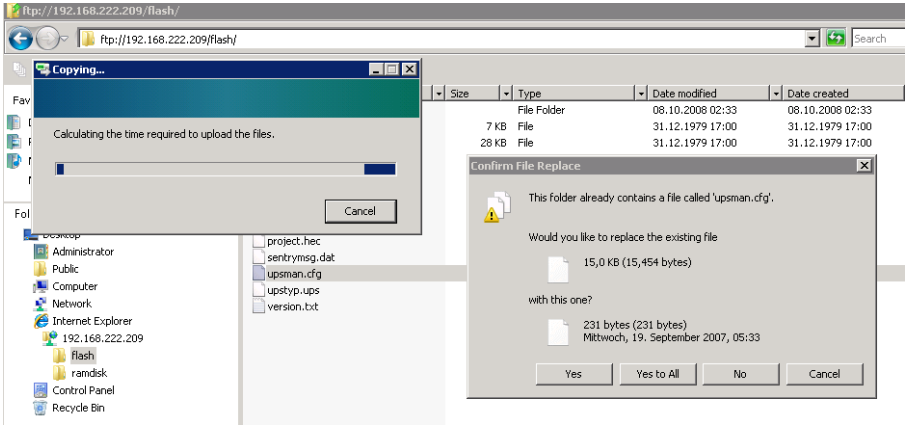


Figure 78: CS121-FTP File Replacement

Just **reboot** (do not select „Save, Exit & Reboot“) the CS121 via web-browser.

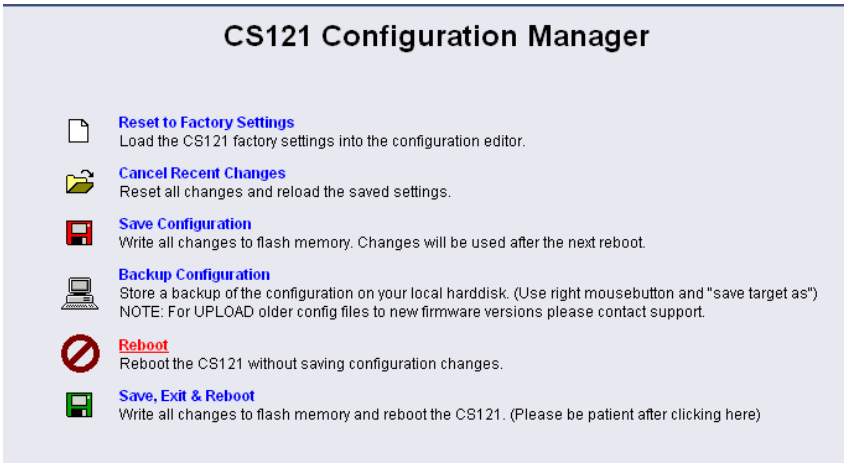

CS121 Configuration Manager
Reset to Factory Settings
Load the CS121 factory settings into the configuration editor.
Cancel Recent Changes
Reset all changes and reload the saved settings.
Save Configuration
Write all changes to flash memory. Changes will be used after the next reboot.
Backup Configuration
Store a backup of the configuration on your local harddisk. (Use right mousebutton and "save target as")
NOTE: For UPLOAD older config files to new firmware versions please contact support.
Reboot
Reboot the CS121 without saving configuration changes.
Save, Exit & Reboot
Write all changes to flash memory and reboot the CS121. (Please be patient after clicking here)

Figure 79: CS121-Reboot

At the reboot, the stored „upsman.cfg“ will be load and the CS121 will obtain the configuration prior of the update.

4.5 Changing the Adapter's MAC-Address

- The MAC-Adress of the CS121 can be changed in 4 steps:

1. Connect your CS121 to the network again, after you successfully flashed the device with new firmware.

2. To connect to the CS121 please enter from a Windows Commandline : "hymon.exe <ip adress of your CS121> 4000"

Example: "hymon 10.10.10.10 4000"

You may alternativly open the batchfile "login_HynetOS.bat" and simply change the IP adress. (NOTE: The usage of Hymon requires a JAVA Runtime version 1.3 or higher.)

3. Now you should be connected to your CS121 at the login prompt.

c:\CS121\CS121_Mac_Adresse>hymon 192.168.202.123 4000

Connecting to target 192.168.202.123...ok.

192.168.202.123:/>

4. Enter in the prompt the command: "set MAC <GENEREX MAC Identifier>" <ENTER>

Finish. After this you can enter exit and reboot your CS121.

- **GENEREX MAC Identifier - Address code:**

The GENEREX MAC address range is :

Model CS121 Hardware 131, Typ L,SC,Modbus Version 2005:

00-03-05-0E-XX-XX

Model CS121 Hardware 121, Typ L,SC,Modbus Version 2005:

00-03-05-02-XX-XX

Model CS121 Hardware 131, Typ BSC,BL:

00-03-05-0F-XX-XX

Model CS121 Hardware 121, Typ BSC,BL:

00-03-05-02-XX-XX

BACS, SiteMonitor, SiteManager:

00-03-05-0A-xx-xx

where XX-XX represents the HEX code of the GENEREX CS121 Board's serialnumber (decimal).

- **How to find the CS121 board serialnumber:**

Note: This is not the serial number of the CS121 itself, its the serial number of the CS121. Motherboard. At a CS121 Slot this number is found as a white lable on the board, the text of this lable maybe like this: "SN:B (or C)-xxxxx QC:Passed". The number after SN:B (or C) is the motherboards serialnumber. (If you can not find the label on the motherboard, please contact your USV manufacturer.)

At CS121 external units you have to open the chassis to see this label.

Example 1 : If youre lable is : "SN:B-40985", than the correct command to set the MAC adress for your CS121 is: "set MAC 00-03-05-02-A0-19".

[Alternativly you may use the CS121 Product serial number (e.g. 0123-11328) instead:

Example 2 : If youre Product serial number is : "0123-11328", than the correct command to set the MAC adress for your CS121 is: "set MAC 00-03-05-02-2C-40"]

5. Additional Software

5.1 RCCMD

RCCMD is the client module for integrating an unlimited number of computers of any operating system into an UPSMAN managed UPS facility. The main purpose is to transmit shutdown signal or messages to RCCMD clients in other networks or on other OS.

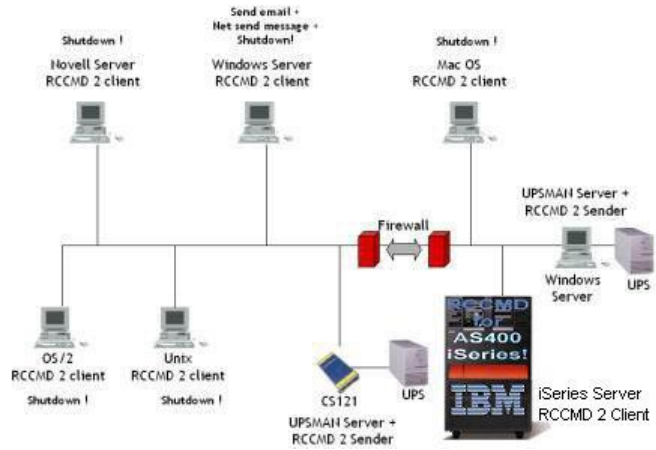


Figure 80: RCCMD - Overview

From the UPS Management Software Suite (optional UPS software product) you may use the module for multi server shutdown “RCCMD” (separate client license required) to shutdown another networking computer, unregarded which OS. (for a complete list of RCCMD supported OS please see the documentation-page of www.generex.de.

Please note that you need for every computer to receive an RCCMD shutdown call another, separate license! If you need to shutdown several 100 of computers in your LAN or WAN within the same company or organization, you may ask your UPS reseller for an “enterprise license” which allows the usage of a single license key for all your computers (optional).

Additionally, RCCMD can send messages and execute other programs on remote computer via the CS121 SNMP adapter. In general, the jobs can be broadcasted and relayed from a machine within its own segment. Depending on the network configuration and the number of RCCMD licenses, an unlimited number of Computers/Servers can be shutdown. Contact your UPS dealer to purchase RCCMD software.

5.1.1 Installation

Please start the installation of the RCCMD-client with the download of the latest version from www.generex.de. (If included, use also the CD from the adapter package) Uncompress the files, execute setup.exe and a wizard guides you through the installation. (Note: Some older versions (using InstallShield5) sometimes stop the installation process with a window, which shows you a completion of 99%. In this case, download the latest RCCMD-Version from the www.generex.de download-page and continue.)

After you entered the Licence-Key a window to configure the IP-address appears. Add the IP-address from the adapter(s), of which the client has to receive RCCND-signals.

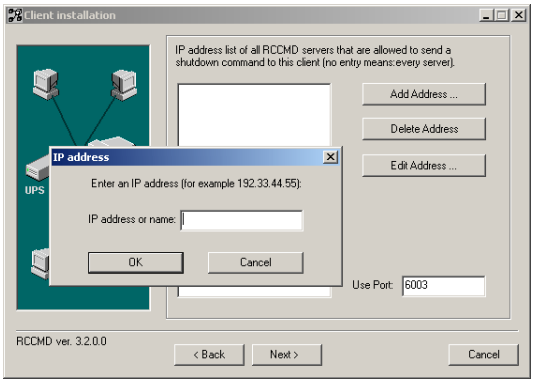


Figure 81: RCCMD Client Installation – IP-Address

The following window gives you the possibility to enable a periodical connection check and to attach a batch-file to be executed in the case of a failure.

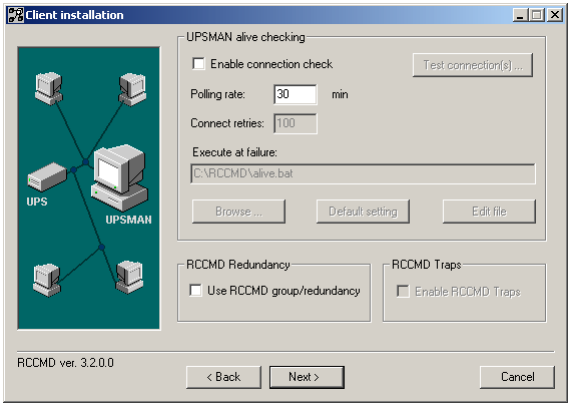


Figure 82: RCCMD Client Installation – Connection check

With the following window you complete the installation by attaching batch-files to each action the RCCMD-client can receive from the CS121-adapter. Usually, you do not need to edit the default-values, because the installation already includes the batch-files as default. Just edit the batch-file, if you want to add or change an action to be executed.

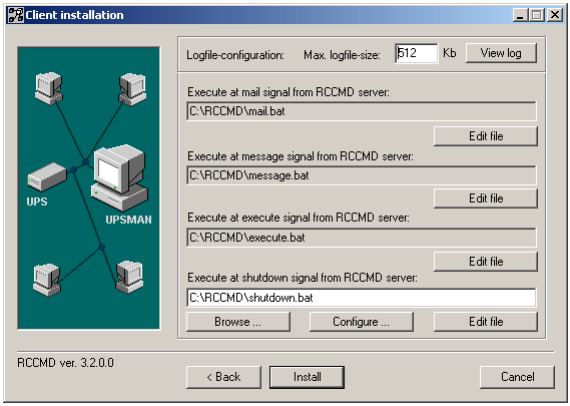


Figure 83: RCCMD Client Installation – Batch-files

5.1.2 RCCMD with SSL for Windows

The Secure Sockets Layer (SSL) protocol is a cryptographic protocol that provides security and data integrity for communications over TCP/IP networks.

Use your Web-browser to navigate to the address of your UPS Web-Manager. Click the "Network & Security" configuration button and enable the SSL network feature.

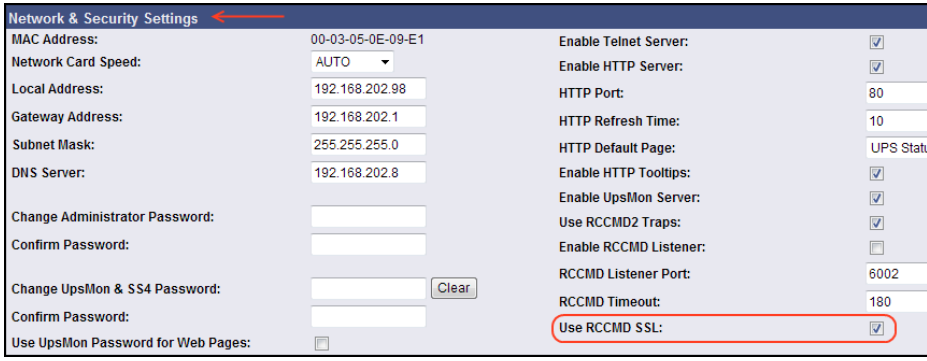


Figure 84: RCCMD SSL Settings

The SSL network feature requires correct time settings, so it is required to configure a timeserver. Click the „Timeserver" configuration button and enter the address of at least one timeserver.

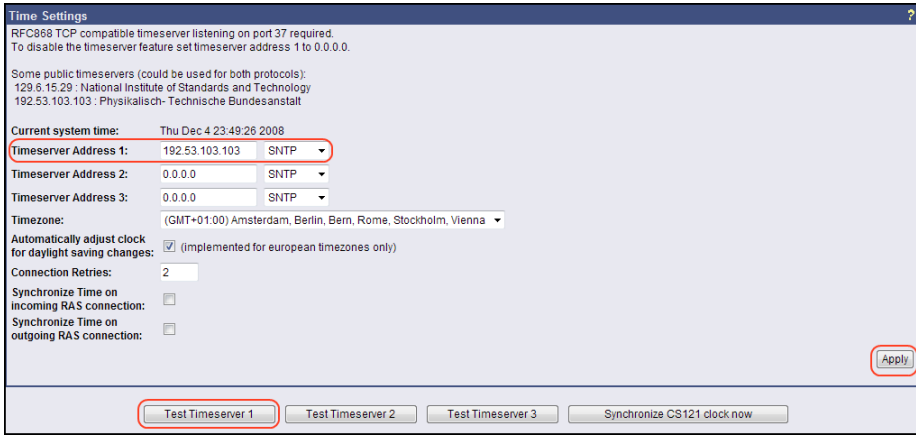

Time Settings
RFC868 TCP compatible timeserver listening on port 37 required.
To disable the timeserver feature set timeserver address 1 to 0.0.0.0.
Some public timeservers (could be used for both protocols):
129.6.15.29 : National Institute of Standards and Technology
192.53.103.103 : Physikalisch- Technische Bundesanstalt
Current system time: Thu Dec 4 23:49:26 2008
Timeserver Address 1: 192.53.103.103 SNTP
Timeserver Address 2: 0.0.0.0 SNTP
Timeserver Address 3: 0.0.0.0 SNTP
Timezone: (GMT+01:00) Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna
Automatically adjust clock for daylight saving changes: (implemented for european timezones only)
Connection Retries: 2
Synchronize Time on incoming RAS connection:
Synchronize Time on outgoing RAS connection:
Apply
Test Timeserver 1
Test Timeserver 2
Test Timeserver 3
Synchronize CS121 clock now

Figure 85: Timeserver Settings

Click the „Save Configuration" button and the „Save, Exit & Reboot" button to confirm your settings.

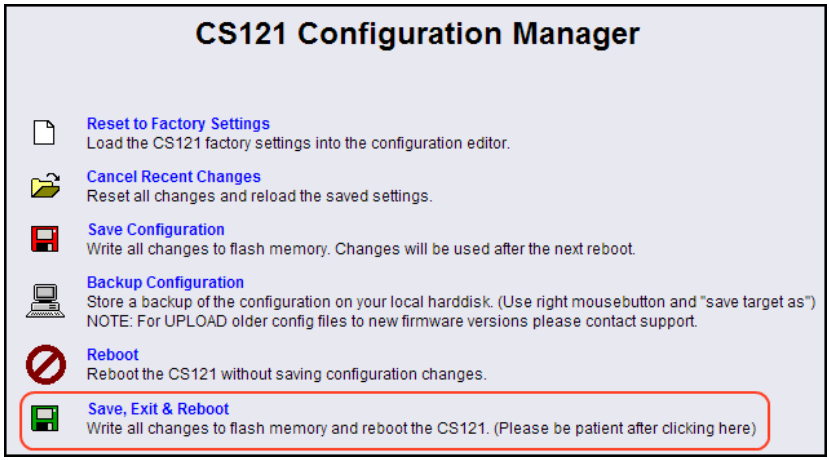

CS121 Configuration Manager
Reset to Factory Settings
Load the CS121 factory settings into the configuration editor.
Cancel Recent Changes
Reset all changes and reload the saved settings.
Save Configuration
Write all changes to flash memory. Changes will be used after the next reboot.
Backup Configuration
Store a backup of the configuration on your local harddisk. (Use right mousebutton and "save target as")
NOTE: For UPLOAD older config files to new firmware versions please contact support.
Reboot
Reboot the CS121 without saving configuration changes.
Save, Exit & Reboot
Write all changes to flash memory and reboot the CS121. (Please be patient after clicking here)

Figure 86: Settings Confirmation

Start the RCCMD Wizard installation again and enable the SSL network feature.

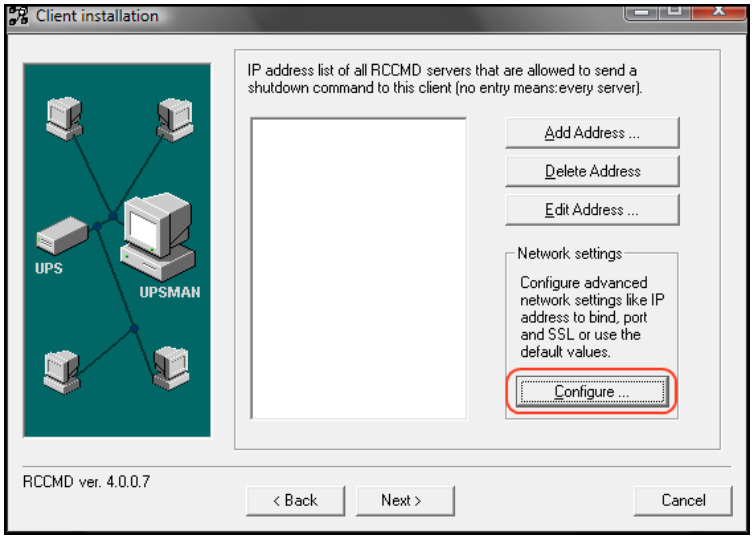

Client installation
IP address list of all RCCMD servers that are allowed to send a shutdown command to this client (no entry means:every server).
Add Address ...
Delete Address
Edit Address ...
Network settings
Configure advanced network settings like IP address to bind, port and SSL or use the default values.
Configure ...
UPS
UPSMAN
RCCMD ver. 4.0.0.7
< Back
Next >
Cancel

Figure 87: SSL Configuration

Figure 88: Advanced Network Settings

5.1.3 RCCMD with own SSL certificates

In this chapter we will describe, how to use an own SSL certificate with RCCMD, e. g. OpenSSL (http://www.openssl.org):

Be your own CA

Using OpenSSL it is quite simple to become your own CA. Just run:

```
CA.pl –newca
```

Done! Just ensure, that you select a useful CN (common name)!

Create your RCCMD certificate

You need to create your certificate for RCCMD now. As it will use it for verification, it should contain the same useful common name (CN), that you selected for the CA. The private key must not be encrypted to let the RCCMD Client (service) start without trouble. Therefore we use the "–nodes" option and the "-newreq" command:

```
CA.pl –newreq -nodes
```

Sign with your CA:

```
CA.pl –sign
```

Now create an empty file named "rccmd.pem" and copy the cert information of *newcert.pem* (rccmd certificate), *newkey.pem* (private key) and *cacert.pem* (CA) into it. Please note, that the exact copying is required to use it without trouble!

Use your own RCCMD certificate

Do the following steps at the RCCMD Client and every sender (e. g. UPS Web Manager):

- Backup the existing "rccmd.pem"
- Replace the existing "rccmd.pem" with your own
- Restart the RCCMD Client
- Restart the RCCMD Sender

5.1.4 RCCMD client as relay station

In order to reach a bigger number of RCCMD receivers, the adapter needs to be operated as relay station. The receiver will be configured so that it will receive a RCCMD signal and this signal is then used to start a batch file, which then starts even more RCCMD sender signals. This computer is then sender and receiver at the same time and is therefore an important link in the UPS monitoring chain. Generally the use of an RCCMD client as relay stations makes the management of several 100 RCCMD clients far easier than configuring this via the Webbrowser interface of the CS121. Additionally, all Webrowser Event configurations have a certain limitation so that you have to use the relay function if the number of jobs exceed e.g. 50 per event at the CS121 HW 131, at older CS121s even earlier.

See the following script, which lets the RCCMD-client act as relay station:

```
@ECHO off
REM --- Created by RCCMD configuration ---
SET path=C:\WINDOWS\;C:\WINDOWS\system32\;C:\RCCMD
SET path=%path%;C:\RCCMD\
RELAY RCCMD
# This batch will send RCCMD shutdown calls to the the IP adresses liste below
# At the end of the batch this computer will initiate the local shutdown
rccmd -s -a 191.168.200.5
rccmd -s -a 191.168.200.6
rccmd -s -a 191.168.200.7
rccmd -s -a 191.168.200.8
rccmd -s -a 191.168.200.9
rccmd -s -a 191.168.200.10
rccmd -s -a 191.168.200.11
# to be continued ..
#
# local shutdown
ExitWin.exe shutdown force
@CLS
```

Figure 89: Example: Batch file to let the RCCMD act as relay station

5.1.5 License regulations

Please note that in order to use these functions legally, the corresponding RCCMD program is installed and started from the UPS-Management Software CD resp. see www.generex.de-download page for the latest version. (see above) The license code can only be used **once per installation**. If more computers need to be added to the shutdown process, additional licenses are required. The CS121-adapter package does usually contain a single licenses for RCCMD to shutdown 1 computer. For more computers to shutdown you have to order separate RCCMD client licenses. Generally the CS121 has an unlimited capacity to shutdown RCCMD clients, but if you have to enter more than 30-50 RCCMD clients via the Webbrowser interface it may make sense to use RCCMD relays (see above).

5.2 gChart

(only older firmware before 4.26) gChart is a GENEREX plug-in for the MS Internet Explorer available as a free download from the GENEREX web site. Quickly and easily visualise all of the CS121-adapter logfiles using Generex's ActiveX graphical log controller GChart when using the Internet Explorer. Discover UPS problems more easily and optimise system tuning more rapidly. Navigate through the data with the mouse using functions like zoom and pan with continuous motion in real time and query interpolated data values by clicking in the areas of interest. Customize the view by moving or toggling off the legend, toggle off and on the data grid and also switch individual log values on and off.

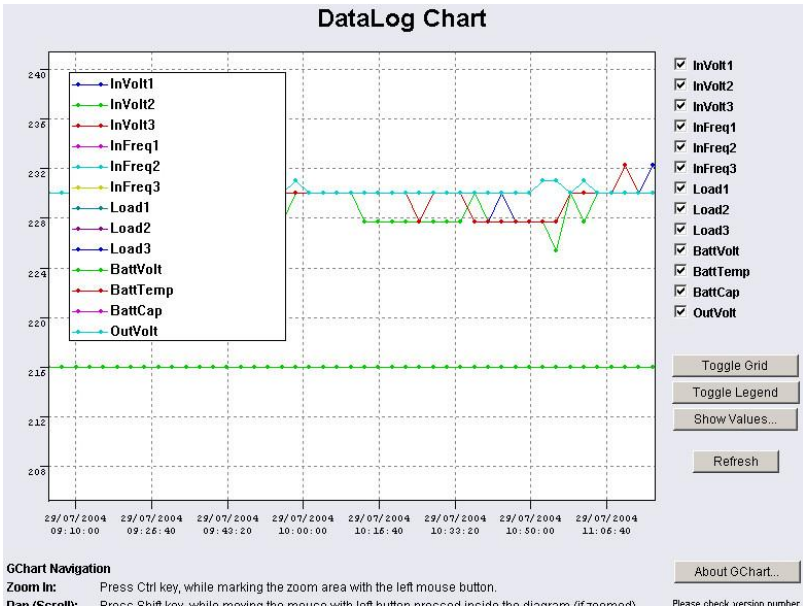


Figure 90: gchart plug-in for the internet explorer

Get the gChart experience now by visiting our online CS121 at: http://q01.generex.de/ and be sure to follow the GChart logfile links.
In order to activate this function, the following adjustments in the Internet Explorer Options are required:
Click via the menu „Tools“ into the Internet Options.
Select the tab „Security“.
Click the „Trusted Sites“ icon, than the „Sites“ button and add the desired IP address.

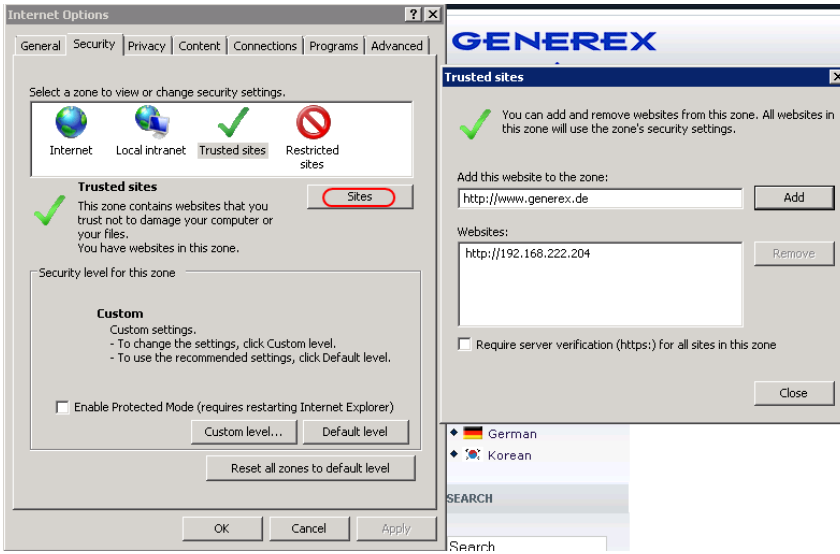


Figure 91: Internet Options of the internet explorer

Close the opened windows via „Close“ and „Ok“.
Click into the Internet Options and Security again. Click via „Custom level...“ into the Security Settings of the Trusted Sites Zone.

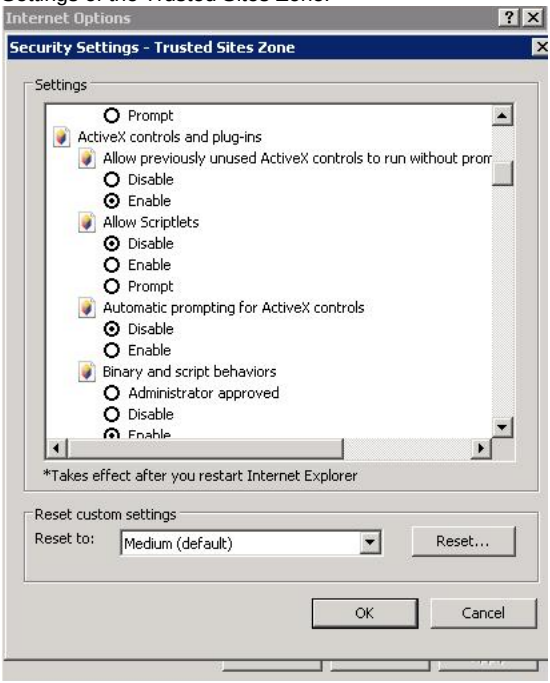


Figure 92: Security Settings

Activate the following options:

- Allow previously unused ActiveX controls to run without prompt
- Download unsigned ActiveX controls
- Initialize and script ActiveX controls not marked as save for scripting
- Run ActiveX controls and plug-ins

Close the opened windows via „Ok“ and restart your Internet Explorer with the desired site.

5.3 UPS monitor (UPSMON)

UPS-Monitor (UPSMON) is the graphical monitoring and command inferface application for UPSMAN and is available in standard and custom interfaces.

In order to display the UPSMAN provided data via the network customer friendly, the modules UPSMON and JAVAMON are delivered for free. The UPSMON is a client for all Microsoft-platforms, whereas the JAVAMON can be started on all operating systems, that support JAVA. A LAN, WAN, or the Internet (TCP/IP) connection can be used as a connecting network between UPSMAN and the management interfaces. Both graphic interfaces can be customised to the demands of the UPS manufacturer, that’s why the UPSMON appearance differs for almost every UPS maker product. This allows for an adaptation of all UPS systems with all different kinds of functions. UPS systems, with serial interfaces often incorporate of a variety of measured values and status information. Those can be displayed using overview or

block diagrams. Other devices, such as diesel generators or extra measuring units can be integrated with this management software via the network. A separate password protected screen can be created, if the devices also support remote controlling commands. The values and status information, which are stored in the UPSMAN log file, can be requested from every computer with an installed UPS monitor module.

Features:

- Monitoring of all UPS systems that are connected in the network via UPSMAN and respective SNMP adapter
- gCHART dynamic visual log file graphic tool
- Remote controlling of all UPS systems via the network
- Graphic display of the UPS input data (voltage, power)
- Read out and display of the UPSMAN event-log files
- Programming of the UPSMAN scheduler
- Graphic screens containing all UPS information also under UNIX, MAC (JAVAMON)

6. CS121-Enhancements, Field of applications

6.1 SiteSwitch4 (SS4) and SiteSwitch4AUX (SS4AUX)

Figure 93: SideSwitch4 and SS4 AUX

SITEWITCH4AUX is a high-performed extension of the CS121-adapter but can also be operated as stand-alone solution with the possibility to connect to UPS or UPS-similar devices. The SITESWITCH has 4 power outputs sockets, which can be configurated by the event settings of the CS121 or any other RCCMD compliant sender like SITEMANAGER, SITEMONITOR.

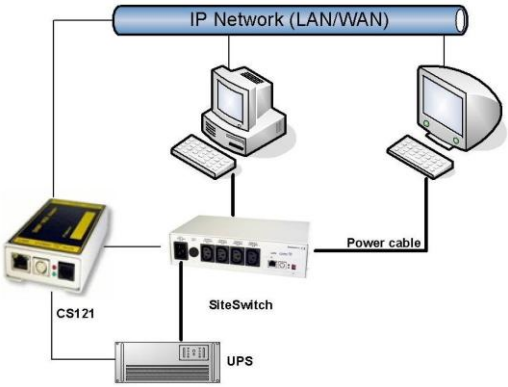


Figure 94: CS121-Installation with SideSwitch4

Using the integrated Webserver, the SITESWITCH 4 enables the monitoring and the remote control of its 4 power outputs. The power sockets can be switched on and off individually. This can be done either manually via the HTML browser interface or UPSMON or automatically using the EVENT manager of the CS121 - or any other network CS121 or compatible device. When executing the action using the EVENT manager of the CS121, the power switching can be preconfigured to run with delays or to run on a schedule. Both the UPSMON time scheduler and the HTML time scheduler can be used to configure a power switching time schedule.
This task can also be achieved using the full version of the UNMS UPS Network Management Software.

Note: (only SS4, not SS4AUX) If you wish to use a UPS with your SS4 then you must install the appropriate CS121 Firmware on your SS4. The default Firmware on SS4 (OEMID 27) is for the usage without UPS, as standalone remote powerswitch. For UPS usage at the SS4 you must also be sure to set the Exchange COM Ports checkbox and then use the configuration cable to connect the SS4 with your UPS.

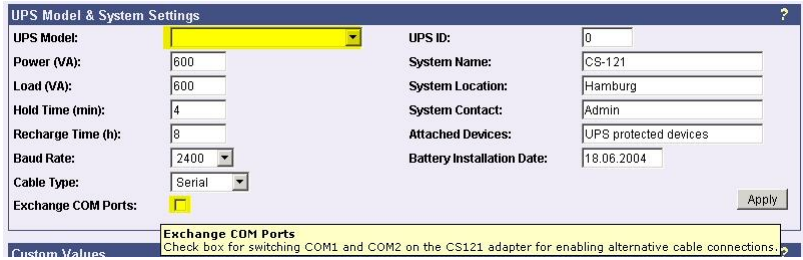


Figure 95: Exchange COM Ports 1 & 2 for SS4

6.1.1 SS4 Feature overview

- 4 configurable powers sockets with a breaking capacity of 230V/8A
- Power socket status indicator via HTML, UPSMON, UNMS or SNMP
- Control via the internal CS121 or via remote CS121 or RCCMD compatible devices
- Remote control of the powers sockets via HTML Browser (Password protected)
- LED-Status of the power sockets
- Small metal casing with 1.5RU, designed for 19"-Rack Mountings (mounting frame included)
- High breaking capacity (8A), input with IEC 16A.
- Programmable power switching via the HTML and UPSMON Scheduler
- Delay of alarm (e.g. UPS alarms) triggered power switching on COM1 of the CS121

6.1.2 SS4 Contents

- SITESWITCH 4
- 16A IEC 230V power cable
- 2 mounting irons for 19“-Rack installation
- manual for SS4

The manuals are being constantly updated and therefore the reader is encouraged to check our website for a newer download version of the adapter manual. Check http://www.generex.de for manual updates.

6.1.3 SS4 Installation

The power consuming devices are connected to the SS4 using IEC 250 VAC/6A plug cables. The SS4 has 4 IEC 250VAC/6A chassis sockets that can be switched on and off separately. Special notice is to be given to the 8A threshold breaking capacity; exceeding this limit will cause the SS4 fuse to break leaving all connected devices without electricity.

Note: Due to errors that may cause the switched off power outlet to remain on it is necessary to conduct the following: Before connecting any power consuming devices with the SITESWITCH 4 or working on any power consuming devices already connected to the SITESWTICH 4, make sure that the SITESWITCH 4 is not connected to the power supply by pulling its power cable out of the power socket.

Use the provided mounting irons to fix the SS4 into a 19“ rack. Place the SS4 so that the front panel of the SS4 can be securely screwed onto the 19“ rack housing while insuring also that the power cables can be connected from behind as well.

As soon as all of the power consuming devices are connected to the SS4, the IEC 16 power supply cable can be connected. Upon establishing power to the SS4, the green „POWER„ LED will light up, and the 4 „Power Socket Status LED“ one for each of the sockets should be unlit. This means that none of the sockets are being provided with power thus cutting the connected devices from the power supply.

The CS121 establishes a user interface for the SS4 for which the user has the option of using either UPSMON, Webbrowser, UNMS or an SNMP-Program. All communications take place either through a modem or network connection. Detailed information is covered in section 7.7.9 AUX and SS4 Settings.

6.1.4 SS4 - Technical data

Inputvoltage:	230V AC +/- 5%
Max. Power Input:	16A
Max. Power Output per socket:	8A (Load at cos phi 1)
Dimensions	260x180x60mm (BxTxH), with 19" : 1,5U
Operating temperature:	0-40°C/rel.Humidity0-95% non condensating

6.2 Sensor SM_T_COM

The SM_T_COM is a temperature sensor for the use with a GENEREX CS121. It has a range from -25° - 100° Celsisus (-13° –212° Fahrenheit) and comes with a 1.8 meter cable for connecting to the CS121 COM2 port. The SM_T_COM is designed for monitoring and management of 19"- racks, UPS rooms, server and data center rooms and for industrial applications. Simple Plug' n Play connections insure that the sensor can be easily and safely installed.

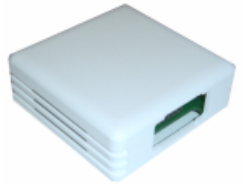


Figure 96: The Sensor SM_T_COM

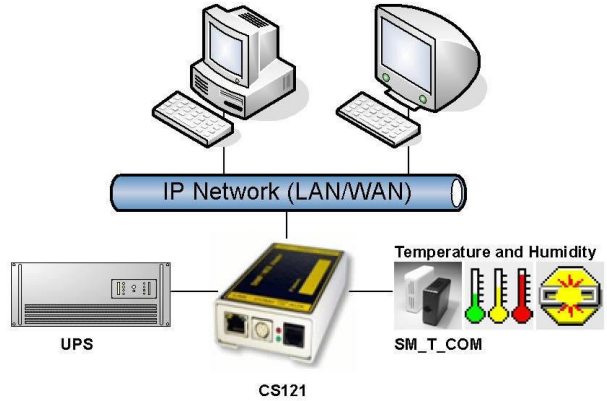


Figure 97: CS121-Installation with temperature SM_T_COM

The SM_T_COM (also available as SM_T_H – a combination of Temperature and Humidity) is a temperature sensor with an RS232 protocol which can be connected directly to the CS121 COM2 port. (Not BUDGET series).

The SM_T_COM shows the actual values on the CS121 Webserver screen and allows to trigger alarms, emails, messages in case the values exceed configurable thresholds. SM_T_COM is simply connected with the original CS121-TEMP cable (part of every CS121 SC and L) to the COM2. In the Webinterface COM2 & AUX you have to change to the COM2 mode to "SM_T_COM", press "apply" and "save&exit" and reboot to start the CS121 with your new settings. The Configuration of thresholds and Events is made via the Event-configuration windows and the SM_T_COM configuration page.

6.2.1 SM_T_COM configuration

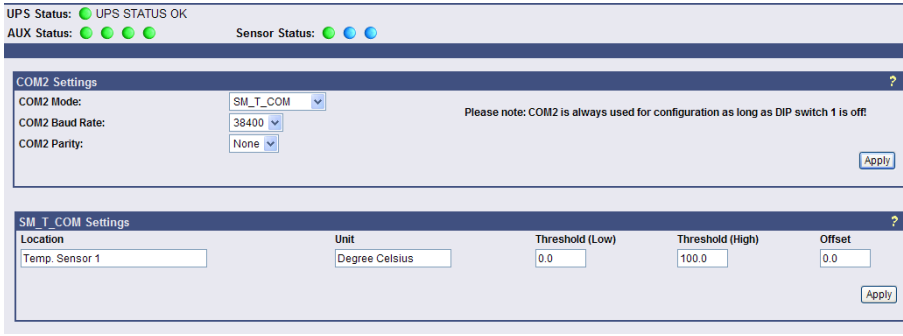


Figure 98: CS121- SM_T_COM Settings

Enter the desired values for the Threshold (low) and Treshold (high).

You can calibrate every sensor with the Offset, that means if you want to rise a measured value for 5°C, just modify the default range from 0.0 to 5.0. Therefore you are able to adjust the measurement values like a gauged thermometer.

You can define the following functions for SM_T_COM Events (see figure below).

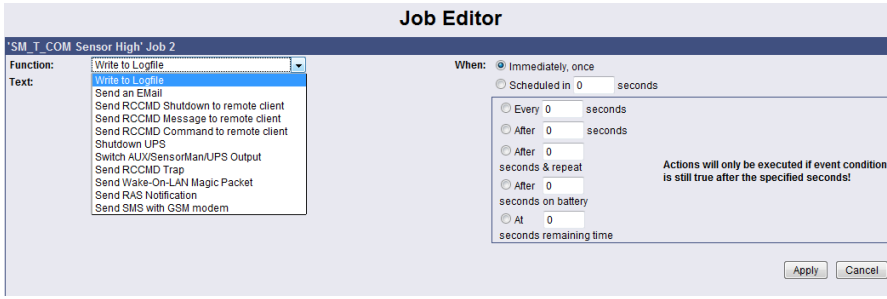


Figure 99: CS121- SM_T_COM Functions

The CS121 firmware version 4.26.x provides the option to define threshold events for the analogue inputs. Click the “Configure Threshold Events” button into the CS121 “Events/Alarms” menu.

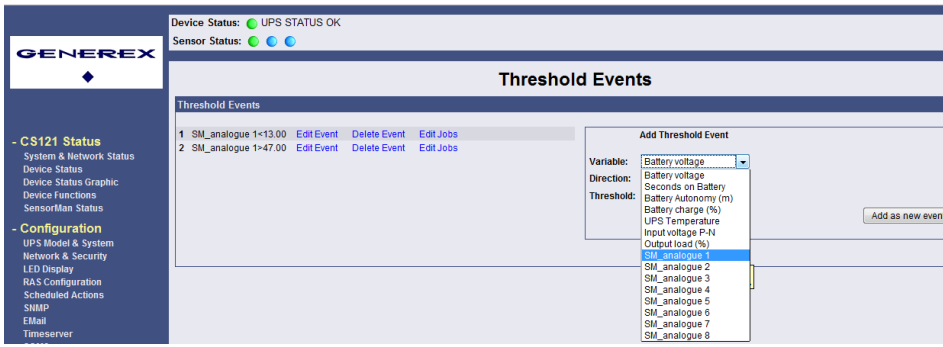


Figure 100: CS121-Configuration Threshold Events of analogue Inputs

In this example, a below threshold of 13 was defined for SM_analogue 1, in this case for the temperature in °C, which will appear into the Event Configuration, after you executed the “Save, Exit & Reboot” function.

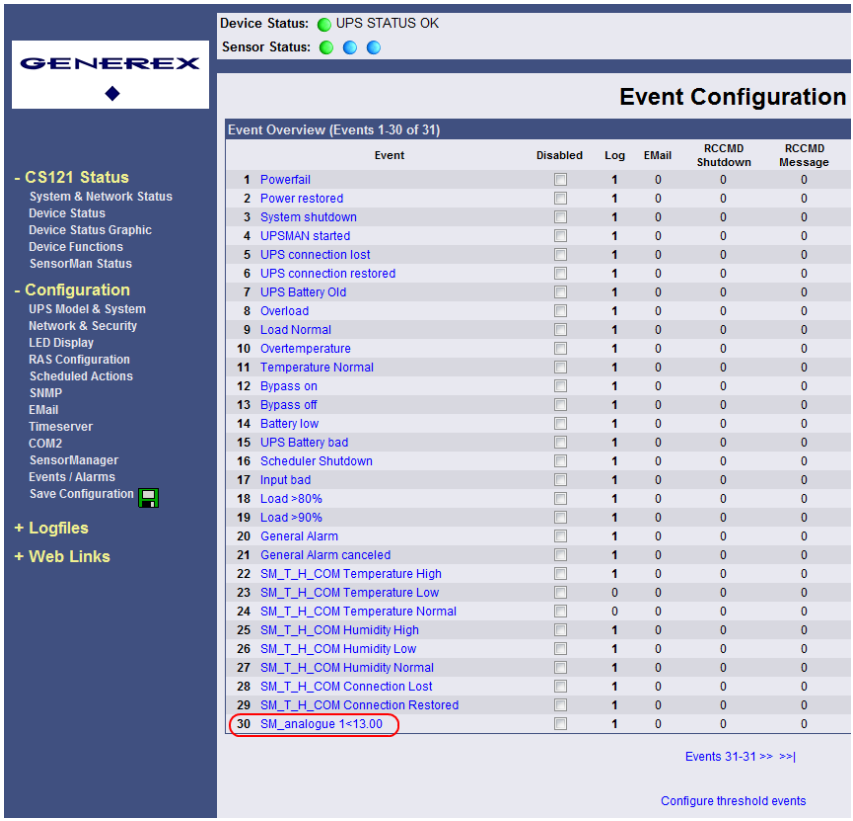

GENEREX
Device Status: UPS STATUS OK
Sensor Status:
Event Configuration
Event Overview (Events 1-30 of 31)
Event
Disabled
Log
EMail
RCCMD Shutdown
RCCMD Message
1 Powerfail 1 0 0 0
2 Power restored 1 0 0 0
3 System shutdown 1 0 0 0
4 UPSMAN started 1 0 0 0
5 UPS connection lost 1 0 0 0
6 UPS connection restored 1 0 0 0
7 UPS Battery Old 1 0 0 0
8 Overload 1 0 0 0
9 Load Normal 1 0 0 0
10 Overtemperature 1 0 0 0
11 Temperature Normal 1 0 0 0
12 Bypass on 1 0 0 0
13 Bypass off 1 0 0 0
14 Battery low 1 0 0 0
15 UPS Battery bad 1 0 0 0
16 Scheduler Shutdown 1 0 0 0
17 Input bad 1 0 0 0
18 Load >80% 1 0 0 0
19 Load >90% 1 0 0 0
20 General Alarm 1 0 0 0
21 General Alarm canceled 1 0 0 0
22 SM_T_H_COM Temperature High 1 0 0 0
23 SM_T_H_COM Temperature Low 0 0 0 0
24 SM_T_H_COM Temperature Normal 0 0 0 0
25 SM_T_H_COM Humidity High 1 0 0 0
26 SM_T_H_COM Humidity Low 1 0 0 0
27 SM_T_H_COM Humidity Normal 1 0 0 0
28 SM_T_H_COM Connection Lost 1 0 0 0
29 SM_T_H_COM Connection Restored 1 0 0 0
30 SM_analogue 1<13.00 1 0 0 0
Events 31-31 >> >>|
Configure threshold events
- CS121 Status
System & Network Status
Device Status
Device Status Graphic
Device Functions
SensorMan Status
- Configuration
UPS Model & System
Network & Security
LED Display
RAS Configuration
Scheduled Actions
SNMP
EMail
Timeserver
COM2
SensorManager
Events / Alarms
Save Configuration
+ Logfiles
+ Web Links

Figure 101: CS121-Configuration Threshold Event for SM_analogue 1

6.3 SENSORMANAGER & SENSORMANAGER II

6.3.1 General information

If more than 1 or 2 environmental values are wanted to manage, than the SENSORMANGER (SensorMan) is your choice. This device is a data measurement and collecting unit which allows the individual measurement and monitoring of 8 analog measurement devices (0-10V) and 4 digital alarm inputs or 4 outputs (open collectors).

Figure 102: Sensor Manager (SensorMan)

The SENSORMANAGER is a system extension for the CS121 Professional, BACS WEBMANAGER, CS121 Mini und CS121_R_II.Universal Remote Sensor Control Box for the monitoring of temperature, humidity and many other types of sensors as well as for the the management of digital input/output signals. 8 analog inputs (0-10V), + 4 digital input and/or outputs (48 V 500mA). Digital Outputs are configurable as normally open or as normally closed. Digital input connections directly through sensor for some models or connect directly to

the RJ11 socket. Convenient splitting plug available for attaching two sensors to one RJ11 socket.

Purpose:

- Monitoring of temperatures, humidity and other analog data in computer rooms with automated response to system alarms.
- Alarms can be individually configured and defined for trip contacts such as fire, smoke and intrusion, and minimum/maximum thresholds values can be set for analog devices such as humidity, temperature and pressure, fluid level, etc. – any sensor which transmits its values between 0- 10 V may be connected to a SENSORMANAGER.
- Data logging, logging of alarms, automatic shutdowns of network computers, and other actions can be set as reactions to critical alarms.
- All system operating and configuring can be done remotely via Web browser. The EVENT driven alarm management system of the CS121 informs the administrator of problems and may automatically switch off computers and other devices (Optional extensions: SITESWITCH 4 or SITEMANGER).
- The SENSORMANAGER is an extension to the CS121 Webmanager. If you want to connect any other computing device, please download the RS-232 protocol for the SENSOR MANAGER from our website and adjust your software to this communication type.

Important:

New firmware for your CS121 is available for download at: http://www.generex.de

6.3.2 Installation and Network integration

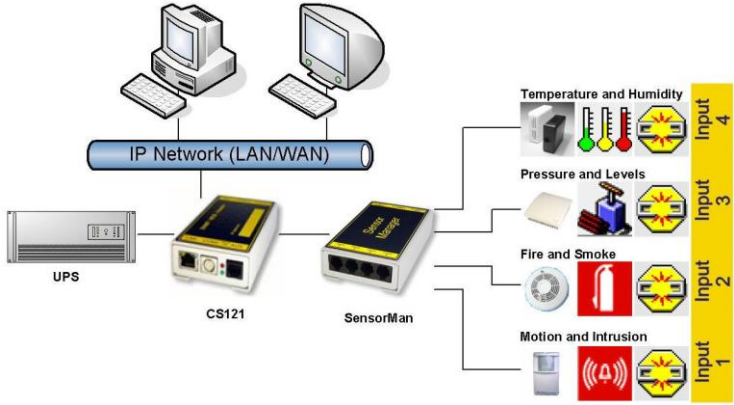


Figure 103: CS121-Installation with SENSORMANAGER

As shown in the figure above CS121 can also be applied to observe and react on alarms of the SENSORMANAGER-Inputs. Therefore, the CS121 COM2 port is connected and configurated for the SensorManager's AUX- and Sensor-Input/Outputs. Within the CS121 configuration it is possible to define actions, which will be released from events of the SensorManager's devices.

Connecting the SENSORMANAGER Box

The SENSORMANAGER has to be connected with the original configuration cable of the CS121 to COM 2.

The sensors for the SENSORMANAGER may be connected direct to the socket Inputs 1-4 using an RJ12 cable. In this configuration you can only use up to 4 sensors. If you want to use

all 8 analog inputs, you have to use a splitting plug (optional) or connect the sensors directly to the Channel Inputs as described above.

If you use the sensor type SM, you may connect a second SM sensor to the input of the first SM. You can not connect more than 2 SM sensors in line.

For connecting an alarm contact to the SM sensor, you may use the first or the second SM contact input/output, but not both. Only one digital input/output is available per socket.

OTHER SENSORS: If you use other sensors than SM, EE or TM, you must use a splitting plug in order to connect more than one sensor to a single INPUT of the SENSORMANAGER.

For setting up the sensors in the SENSORMANAGER make sure your configuration matches your sensor type, e. g. see example:

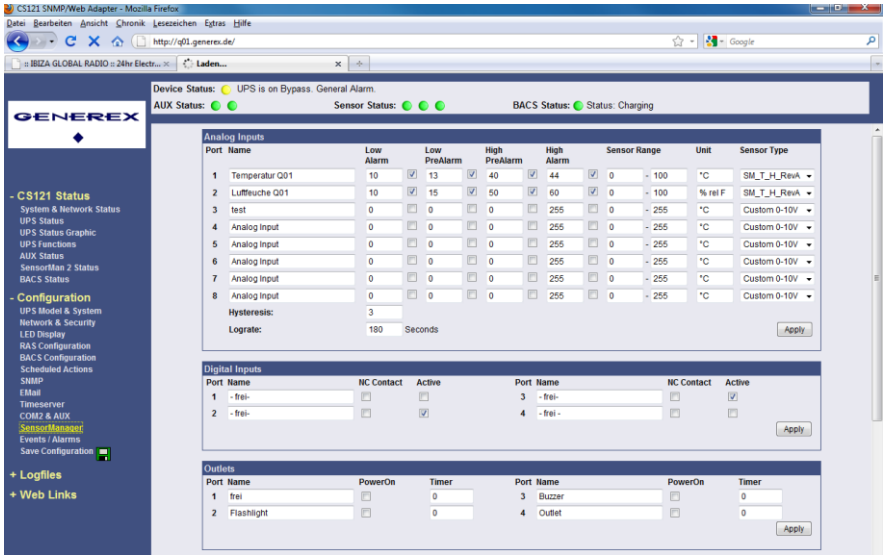


Figure 104: SENSORMANAGER II Settings

Using the splitting plugs (order number SPSMRJ) it is possible to connect up to 8 sensors and 4 contacts to the SENSOR- MANAGER. A MOUNTING KIT (sold separately) is available for affixing the SENSORMANAGER to walls and railings.

The power supply for the SENSORMANAGER may also supply an external CS121 using a SM-CS121 type cable (sold separately) by simply connecting the POWER OUT of the SENSORMANAGER with the POWER IN of the CS121 external.

Startup the SENSORMANAGER

Connect the sensors to the SENSORMANAGER. Connect the SENSORMANAGER using the Mini8-DBSub9 cable to the COM 2 port of the CS121. Finally, plug the power supply into one of the UPS power outlets. Check the LEDs on the bottom of the SENSORMANAGER; the right one should be flashing (reading request from CS121 COM2) and the left one should be constantly lit (power supply on). The flashing LED shows the requests from the CS121, the other LED shows that the device has started.

Figure 105: SENSORMANAGER II LEDs

Note: You have to configure the CS121 COM2 port to “SensorMan” (for SENSORMANAGER II “SensorMan 2”) – otherwise the CS121 will not start making requests to the SENSOR MANAGER.

See the CS121 user manual for instructions on how to configure the CS121 for operation with the TEMPMAN/SENSOR MANAGER and how to manage and set the alarms.

The latest version of CS121 user manual is available for download at:

http://www.generex.de/wwwfiles/dokus/1/cs121/german/pdf/cs121.pdf

When the SENSOR MANAGER is running, you will see the values in the AUX section of the CS121 Web browser.

Detection of the analog temperature values via variables:

#TEMP1
#TEMP2
#TEMP3
#TEMP4
#TEMP5
#TEMP6
#TEMP7
#TEMP8

Pin layout of INPUT Socket the SENSORMANAGER Box:

INPUT 1:

Pin 1	Voltage 9-24Volt +
Pin 2	Analog Channel 1 (0-10V+)
Pin 3	Analog Channel 5 (0-10V+)
Pin 4	Ground
Pin 5	OUTPUT: Open collector OUT 9-24 V, max. 30mA
Pin 6	INPUT: Digital Input 9-24V

INPUT 2:

Pin 1	Voltage 9-24Volt +
Pin 2	Analog Channel 2 (0-10V+)
Pin 3	Analog Channel 6 (0-10V+)
Pin 4	Ground
Pin 5	OUTPUT: Open collector OUT 9-24 V, max. 30mA
Pin 6	INPUT: Digital Input 9-24V

INPUT 3:

Pin 1 Voltage 9-24Volt +

Pin 2 Analog Channel 3 (0-10V+)

Pin 3 Analog Channel 7 (0-10V+)

Pin 4 Ground

Pin 5 OUTPUT: Open collector OUT 9-24 V, max. 30mA

Pin 6 INPUT: Digital Input 9-24V

INPUT 4:

Pin 1 Voltage 9-24 Volt +

Pin 2 Analog Channel 4 (0-10V+)

Pin 3 Analog Channel 8 (0-10V+)

Pin 4 Ground

Pin 5 OUTPUT: Open collector OUT 9-24 V, max. 30mA

Pin 6 INPUT: Digital Input 9-24 V

Example:

Alarm INPUT contact

If the alarm contact INPUT is used, you may connect your alarm contact e.g. to INPUT 1 Pin 6 and Power supply Pin 1. In the CS121 you can configure that as a HIGH signal to the alarm is set – or the other way round.

OUTPUT contact

If you want to switch any relays or send high signals to the OUTPUT, you may connect your OUTPUT contact e.g. to INPUT 1 Pin 5 to your relays and configure the CS121 as “OUTPUT” for this signal. Now you may configure your Events in the CS121 to set the OUPUT to HIGH or LOW.

Sensor connection

The sensor has to work within 0-10Volts, this may be connected directly to Channels 1-8, and the CS121 will now show the values in its Web browser. Alarm thresholds and actions may be configured via the EVENT manager of the CS121.

6.3.3 Special features of theSENSORMANANAGER II

Unlike the CS121 and the older SENSORMANAGER type, the new SENSORMANAGER II configuration data will be stored in the device itself on a non-volatile chip. This result in a different behaviour of the SENSORMANAGER II compared to the older SENSORMANAGER:

Acknowledged alarms are displayed in yellow in the status bar of the SENSORMANAGER II. Not confirmed alarms are displayed in red (at older SENSORMANAGER always in yellow).

After clicking the “Apply” button no rebooting is required, because the SENSORMANAGER II saves it configuration data in its internal ROM.

The 3 status diodes will be displayed in blue, if the communication between the CS121 and the SENSORMANAGER II is lost.

The status site of the SENSORMANAGER II was changed. The analog measurement values will be displayed vertical.

Figure 106: SENSORMANAGER II Status Site

6.3.4 Configuration

The SENSORMANAGER II provides the opportunity of the definition of pre-alarm-thresholds.

Beside the name of the input you also define here as shown above the alarm thresholds, the sensor range and the measurement unit. Note, that the alarm values (low and high) are only active if the fields beside the alarm values are enabled. In the drop down menu “Sensor Type” some basic sensor models are already listed, which you can choose to set predefined values for these types (select “Custom” to make divergent or individual settings).

You can calibrate every sensor with the Sensor Range, that means if you want to rise a measured value for 5°C, just modify the default range from 0-100 to 5-100. Therefore you are able to adjust the measurement values like a gauged thermometer.

With the field “Hysteresis” you define the scope within the defined value can oscillate without releasing an alarm. This is important e.g. for temperature measurements, which are not increasing/decreasing continuously.

At “Lograte” you can set the loop time (in sec) in which the measured values will be written into the logfile.

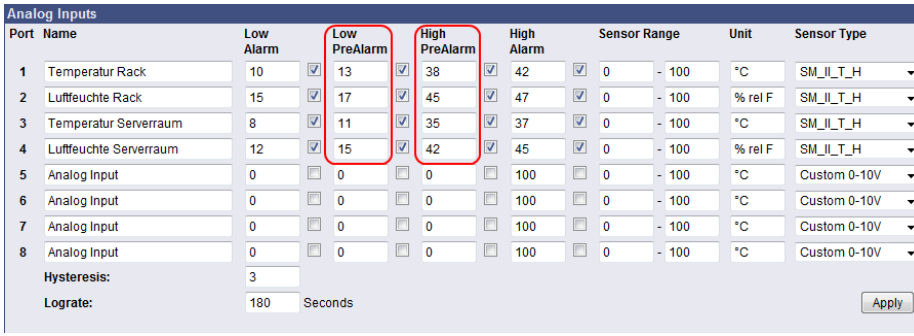

Analog Inputs
Port Name Low Alarm Low PreAlarm High PreAlarm High Alarm Sensor Range Unit Sensor Type
1 Temperatur Rack 10 13 38 42 0 - 100 °C SM_II_T_H
2 Luftfeuchte Rack 15 17 45 47 0 - 100 % rel F SM_II_T_H
3 Temperatur Serverraum 8 11 35 37 0 - 100 °C SM_II_T_H
4 Luftfeuchte Serverraum 12 15 42 45 0 - 100 % rel F SM_II_T_H
5 Analog Input 0 0 0 100 0 - 100 °C Custom 0-10V
6 Analog Input 0 0 0 100 0 - 100 °C Custom 0-10V
7 Analog Input 0 0 0 100 0 - 100 °C Custom 0-10V
8 Analog Input 0 0 0 100 0 - 100 °C Custom 0-10V
Hysteresis: 3
Lograte: 180 Seconds
Apply

Figure 107: SENSORMANAGER II Configuration Analog Inputs

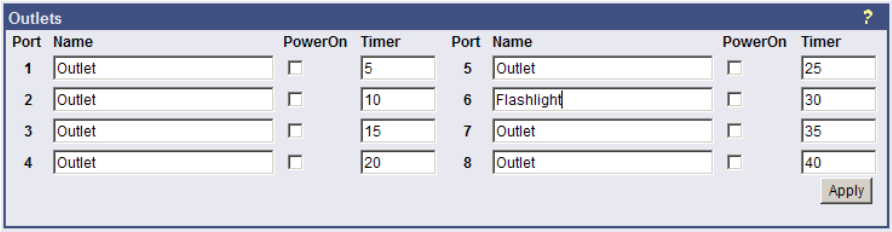

Outlets
Port Name PowerOn Timer Port Name PowerOn Timer
1 Outlet 5 5 Outlet 25
2 Outlet 10 6 Flashlight 30
3 Outlet 15 7 Outlet 35
4 Outlet 20 8 Outlet 40
Apply

Figure 108: SENSORMANAGER II Configuration Outlets

Furthermore it is possible to attach a timer value to each Outlet. This determinates how long an outlet will be switched (in seconds). Set the timer value to "0" if the outlet is to be switched without any time limit.

Note: If you do not want to use a name for the Analog-, Digital Inputs or rather the Outlets, please set the following into the single name area: ` `

6.3.5 Alarm Matrix of the SENSORMANAGER II

The following "Alarm Matrix" gives you numerous possibilities to configure dependencies between different alarm states and to logically combine them to different Event. This makes it possible to process an alarm scenario in dependency of the status of several input sensors. (For example: An alarm scenario is to be released only if two temperature sensors are out of range or if the air condition is not active. This requires to create a new event which gets "true" only if 2 or more other events are true)

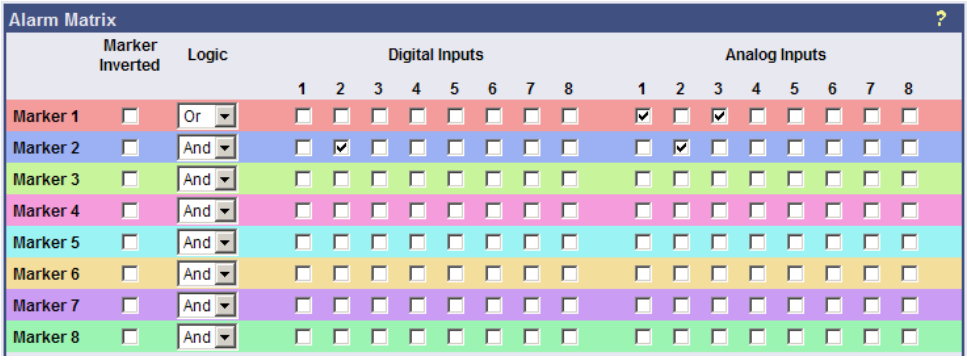


Figure 109: Alarm matrix – Marker configuration

In the figure above is shown the alarm matrix with its 8 markers to be set or unset. Each marker thereby is a new state on which specific alarm scenarios can be released.

For example: In the figure above is configured that the Marker1 will be set, when at the analogue input 1 or 3 an alarm occurs. (Enabling the field "Marker Inverted" causes that Marker1 will be unset in case of an alarm at analogue input 1 or 3.) Furthermore marker 2 will be set, when at the digital input 2 and at the analogue input 2 an alarm state occurs at the same time. (Means that an alarm at just one input is not sufficient for setting marker 2) Accordingly it is possible to set (or unset) each marker in dependency of different digital and/or analogue input states.

After having defined the conditions when markers are to be set resp. unset, you can specify the actions to be executed when a marker will be set/unset. Therefore you have two possibilities: The first is to handle the actions through the event configuration, described later

in chapter 3.2.5 Events / Alarms. This is possible because each marker has its own event “Alarm Marker x”, which can be configured through the event configuration.

The second possibility is to switch a relay output in dependency of the statue of one or several markers. Therefore you have the output matrix, figured as below. In this example is configured that Output 4 is to be switched on when Marker 1 or Marker 2 is set (or the opposite way around in case “Output Inverted” is enabled). Using the “Alarm Matrix” offers you numerous possibilities to switch Outputs in dependency of input alarms.

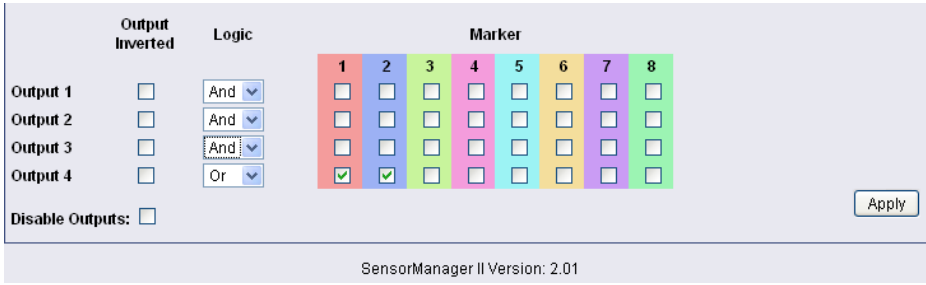


Figure 110: Alarm Matrix – Switching of relay outputs

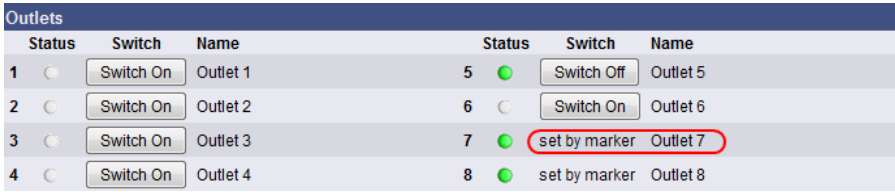


Figure 111: Alarm Matrix – Switching of relay outputs

Detection of the analog temperature values via variables:

#SM2_ANALOG0
#SM2_ANALOG1
#SM2_ANALOG2
#SM2_ANALOG3
#SM2_ANALOG4
#SM2_ANALOG5
#SM2_ANALOG6
#SM2_ANALOG7

6.4 RASMANAGER

The RAS-Manager relays alarm signals coming from monitoring devices such as UPS, SiteManagers, contact alarms and the like to monitoring stations or email receivers. Any computer with RAS capabilities (Windows, Linux) can be used as a monitoring station. The only requirement is the setup of an PPPServer on the monitoring station. After the establishment of communications between the RAS-Manager and the monitoring station, a RCCMD signal is sent that depending on configuration can either make log entries, send emails and SMSs or execute programs.

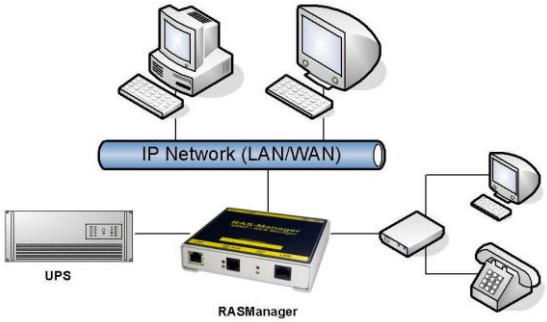


Figure 112: RASMANAGER network integration

6.5 GSM Modem – Notification via SMS

The CS121 firmware version 4.17.x provides a new function, which enables the notification via SMS. Use the CS121configuration cable and an adapter-connector (PINs 2, 3, 5, GENEREX order number: GSM_A) for the connection of the GSM modem and the CS121. Select into the menu “COM2 & AUX” the GSM Modem” for the COM2 mode.

Note: It is required to disable the PIN-code request of the SIM-card.

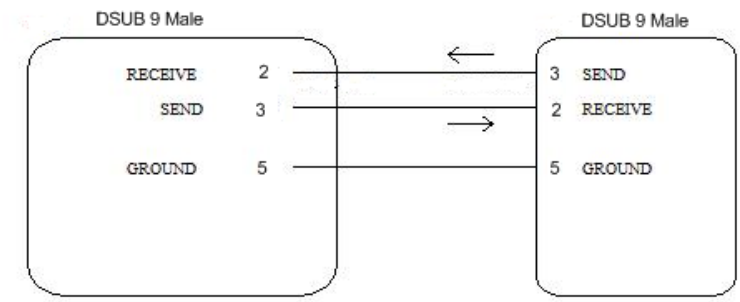


Figure 113: PIN Adjustment Adapter-Connector GSM_A

Alternative, you can make a Mini8-DSUB9 cable for the Siemens GSM TMA T35i Modem by yourself, as follows:

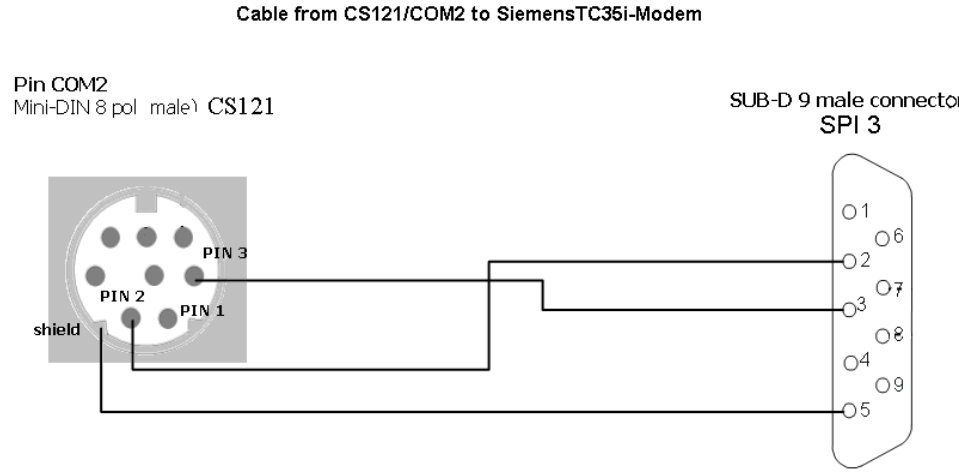


Figure 114: Mini8-DSUB9 Cable Cross-Section

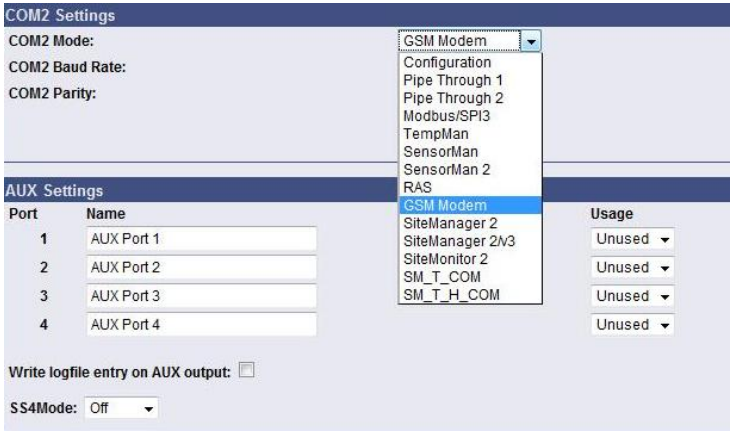


Figure 115: COM2 Mode: GSM Modem

Add an accordant function via the “Events / Alarms” menu. Select the function “Send SMS with GSM modem” for the notification via SMS and set the telephone number of the receiver and the message.

Figure 116: Configuration of the Function

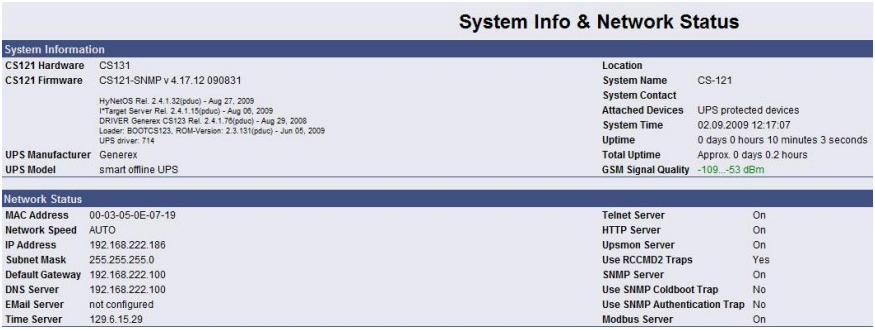
LED Status Display

Operating Status:	LED Signaling:

SIM card not present	Slowly red flashing
SIM card active	Fast red flashing

Figure 117: Siemens GSM TMA T35i Modem

Into the menu “System & Network Status” you can see the signal level of the modem, to adjust your antenna optimal. Green means a good signal is present.



System Info & Network Status

System Information

CS121 Hardware	CS131	**Location**	
CS121 Firmware	CS121-SNMP v 4.17.12 090831	**System Name**	CS-121
	HyNetOS Rel. 2.4.1.32(pduc) - Aug 27, 2009 I²Target Server Rel. 2.4.1.15(pduc) - Aug 06, 2009 DRIVER Generex CS123 Rel. 2.4.1.76(pduc) - Aug 28, 2008 Loader: BOOTCS123, ROM-Version: 2.3.131(pduc) - Jun 05, 2009 UPS driver: 714	**System Contact**	
		Attached Devices	UPS protected devices
		System Time	02.09.2009 12:17:07
		Uptime	0 days 0 hours 10 minutes 3 seconds
UPS Manufacturer	Generex	**Total Uptime**	Approx. 0 days 0.2 hours
UPS Model	smart offline UPS	**GSM Signal Quality**	-109...-53 dBm

Network Status

MAC Address	00-03-05-0E-07-19	**Telnet Server**	On
Network Speed	AUTO	**HTTP Server**	On
IP Address	192.168.222.186	**Upsmon Server**	On
Subnet Mask	255.255.255.0	**Use RCCMD2 Traps**	Yes
Default Gateway	192.168.222.100	**SNMP Server**	On
DNS Server	192.168.222.100	**Use SNMP Coldboot Trap**	No
EMail Server	not configured	**Use SNMP Authentication Trap**	No
Time Server	129.6.15.29	**Modbus Server**	On

Figure 118: GSM Signal Quality Display

6.6 LED-Matrix Display

The LED-Matrix display is a remote display unit for relaying RCCMD messages that can be operated via the Ethernet.

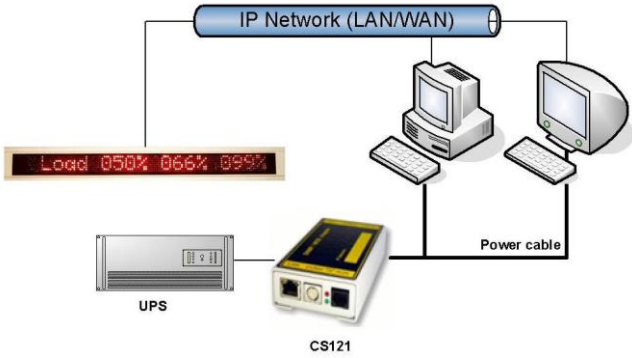


Figure 119: LED-Matrix display network integration

Any device operating as an RCCMD Sender like a computer running UPSMAN software, RCCMD clients, CS121 Web managers and other RCCMD 2 compatible products can send text messages or environmental data values to the LED-Matrix and can add sounding alarms for warnings that require immediate attention. Users can also use the built in Web server interface of the LED-Matrix to relay alarms and messages without the use of an RCCMD Sender. The user simply enters the message into the Web browser that is to be relayed through the LED-Matrix.

For further information and description please take a look into the ***LED-Matrix User Manual***.

6.7 MODBUS / PROFIBUS

- MODBUS

Modbus is a serial communications protocol for use with its programmable logic controllers (PLCs). It has become a de facto standard communications protocol in industry, and is now the most commonly available means of connecting industrial electronic devices. Modbus allows for communication between many devices connected to the same network, for example a system that measures temperature and humidity and communicates the results to a computer. Modbus is often used to connect a supervisory computer with a remote terminal unit (RTU) in supervisory control and data acquisition (SCADA) systems.

The CS121-series (exclude BUDGET models) support MODBUS over IP and MODBUS over RS232 generally. Additionally, the CS121MODBUS-series also includes an RS485 interface at COM2, which can be connected to a 485Bus-system.

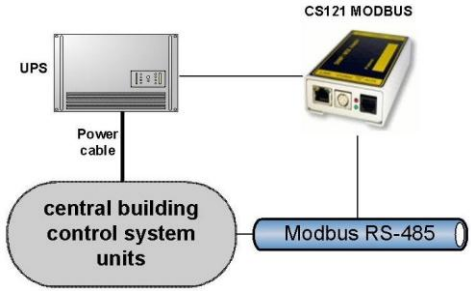


Figure 120: CS121MODBUS Installation

- PROFIBUS, LONBUS and other Field busses

PROFIBUS (**Pro**cess **Fi**eld **Bus**) is the most popular type of fieldbus with more than 14 million nodes (2006) in use worldwide. PROFIBUS was defined in 1991/1993 as DIN 19245, moved in 1996 to EN 50170 and is since 1999 included in IEC 61158/IEC 61784 Standards.

To integrate the CS121 in a Profibus environment, GENEREX offers a Profibus gateway, which converts the MODBUS output of the CS121 into PROFIBUS environment. The implementation of LONBUS or any other GENEREX field bus converter takes place in similar way.

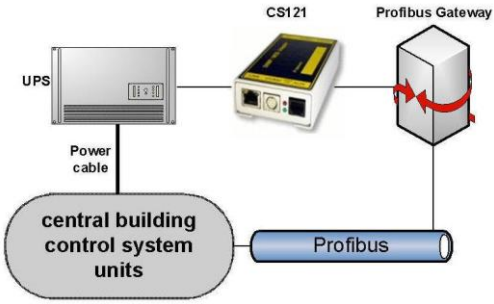
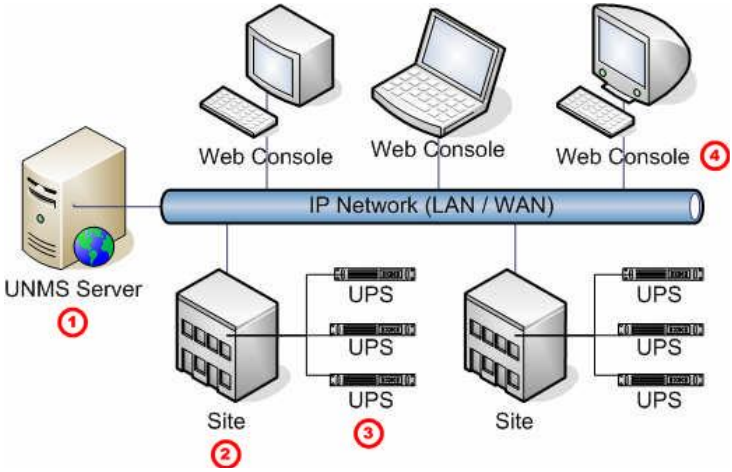


Figure 121: CS121 PROFIBUS Installation

6.8 UNMS (UPS-Network Management System)

UNMS II is a UPS network monitor designed to inform you of emergency power supply systems problems before your clients, end-users or managers do. The UNMS as a limited version is part of every UPSMAN license (UPSMAN suite contains UPSMAN RS232/USB UPS Manager, UPSMON Windows client and UNMS 2 – limited to 9 UPS). The UNMS Server Service runs intermittent checks on UPS devices you specify. When problems are encountered, the UNMS Server Service can send notifications out to administrative contacts in a variety of different ways (For example: Email). Current status information, historical logs, and reports can all be accessed via a web browser (Web Console).



No.	Name	Description
1	UNMS Server	The UNMS Server Service and the related Web-Server installation.
2	Site	A user defined group of services (For example: UPS devices).
3	UPS	A single service (e.g. UPS device) that is monitored by the UNMS Server.
4	Web Console	Web-Consoles provide sharing of management information by many people.

Figure 122: UNMS-Installation

MIB-Integration into your NMS

Standard-NMS Installations require for each device to be monitored its specific MIB (Management Information Base). To monitore the CS121 the Standard-MIB for UPS-systems, RFC1628, is generally to be integrated into your NMS.

To identify CS121 adapters in your network you may use the MAC address. The MAC address of every CS121 adapter starts with 00-03-05-02-XX-XX, whereas this address can be found in the Telnet menu (menu: IP address, gateway address, MIB system group).
Your SNMP adapter is now installed and fully functional. Please read the following for configuration and functionality descriptions of the adapter.

The MIB is to be loaded onto each SNMP Management Station that is monitoring an UPS via an UPS SNMP Agent. The MIB determines which UPS parameters can be monitored and controlled with the SNMP commands „get“ and „set“.

To complete the SNMP adapter installation and configuration process, you must compile the necessary MIBs to configure the NMS. Any NMS with a MIB compiler can manage the SNMP adapter.

Perform a „get" and a „set". If the get or set command fail, check the SNMP adapter access control. The manager must have read permission to execute a get command and read / write permission to execute a set command successfully.

For instructions on how to compile MIBs for the most popular NMSs - Novell's NetWare Management Station, Hewlett-Packard´s OpenView Network Node Manager, and SunConnect; SunNet Manager; see the corresponding heading below.

Please note that the CS121 uses the standard MIB, which is included in most SNMP software already. This MIB is called UPSMIB and corresponds with the Standard RFC1628. In most cases compiling of the MIB is not required as it can be found under:

iso.org.dod.internet.mgmt.mib2.upsMIB

Please check your MIB directory before compiling the RFC1628!

Configure the NMS

- Set/compile the device MIB, if there is no standard UPS MIB RFC 1628 (CS121 only!)
- Add the SNMP adapter object to the management map and configuration of the events (e.g. message to the operator)
- Ping the SNMP adapter

Due to the different compilation procedures of the SNMP software products, it is not possible to explain the general procedures in greater detail. The compilation of a MIB file is explained in the general SNMP software manuals. Please contact the support, if you cannot resolve errors using this manual.

After the compilation the UPS software can be polled via a MIB browser and data can be read. Please choose the corresponding MIB variable or string of MIB variable and set the destination address TCP/IP of the adapter. The adapter will answer with the UPS data.

Alternatively the Windows UPSMON, JAVAMON or the UPS SNMP WATCH of the DataWatch Pro Software can be used. The UPS data will then be displayed graphically and internal UPS information, which are only useful to the technical support, will be hidden. In addition to this, the UPS SNMP WATCH is able to manage groups of UPS devices, in order to manage parallel redundant UPS systems.

As an optional add-on for the HP OpenView software, a snap-in may be ordered for UPSMAN/CS121.

Note: (SNAP-IN FOR HP OPENVIEW for WINDOWS NT, SNAP-IN FOR HP OPENVIEW for HP UNIX). This software implements itself into the HP Openview Node Manager surface and displays UPS devices as objects in the colors GREEN (OK), GREEN and RED (Alarm). With a mouse click, the graphic window starts (JAVAMON or Windows UPSMON) and displays current UPS data.

7. Troubleshooting – FAQ

Problem: Inform Pyramid DSP Series Communication with UPS Slotcard inside does not start the UPS communication or if the external RS232 communication does not work.

Solution: It is required to put the DIP switches onto the UPS mainboard into the position “ON”, if you are using a CS121 SNMP slot card! Put the DIP switches into the position “OFF”, if you are using an external CS121 via RS232 interface!

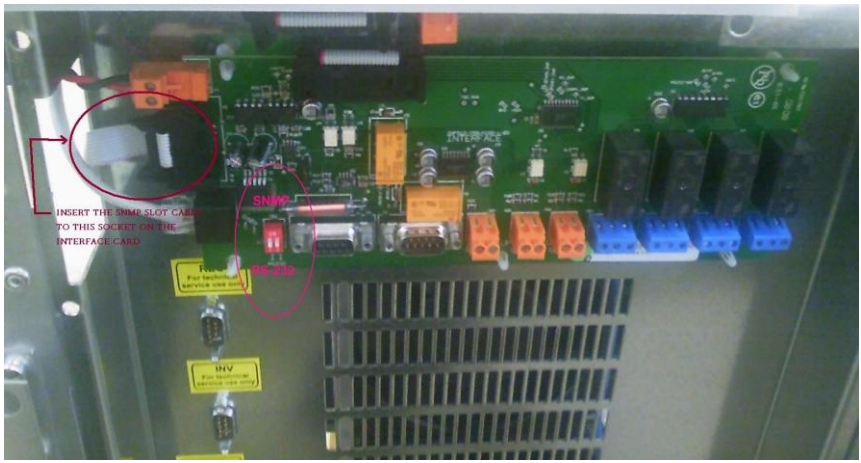


Figure 123: Mainboard Inform Pyramid DSP

Appendix

A. CS121 - Technical data

Product	Power	Size	Weight	Operating temperature
CS121L (Extern)	12VDC 300 mA.	12,5 x 7 x 2,8 cm	210 gr.	< 40° C
CS121SC (Slot chinese)		13,5 x 6 x 1,5 cm	66 gr.	< 40° C
CS121F (Slot FUJI)		7,5 x 8 x 1,5 cm	64 gr.	< 40° C
CS121R (Slot RIELLO)		14,5 x 7,5 x 1,5 cm	80 gr.	< 40° C
CS121MOD (MODBUS Extern)		12,5 x 7 x 2,8 cm	210 gr.	< 40° C
CS121BL (Budget Extern)	12VDC 300mA.	12,5 x 7 x 2,8 cm	202 gr.	< 40° C
CS121BSC (Budget Slot Chinese)		12,5 x 7 x 2,8 cm	59 gr.	< 40° C

	CS121-L	CS121-C	CS121 Slot
Power supply	12 V DC	12 V DC	12 V DC
Power output	350mA	100mA bei 12V	100mA bei 12V
Size	69x126 mm	69x126 mm	60x120 mm
Ethernet connections	10/ 100Base-T	10/ 100Base-T	10/ 100Base-T
RS-232 interface	2	2	2
LED's	4	4	4
DIP Switches	2	2	2
Operating temperature	0 – 40 °C	0 – 40 °C	0 – 40 °C
Humidity during normal operations	10-80%, no condensation		

B. CE- and UL-Certification

Both models, CS121L and CS121SC, are certificated by Underwriters Laboratories Inc. for the US and Canada with the power supply 12 V DC, 300 mA.
As well, for both hardware specifications 121 and 131 of CS121-Adapter a certification of Conformity has been drawn up. Please see the download page at www.generex.de to get a copy of the certifications and documents.

C. Cable and Circuit board configuration, Pin/AUX-Ports, SensorMan

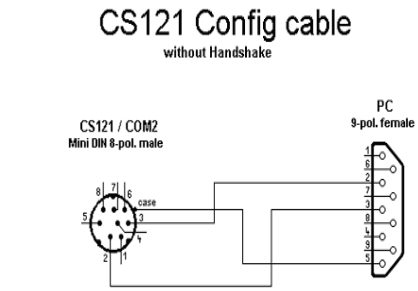


Figure 124: Cable configuration HW121 COM2

CS121 HW121/HW131 configuration cable with handshake

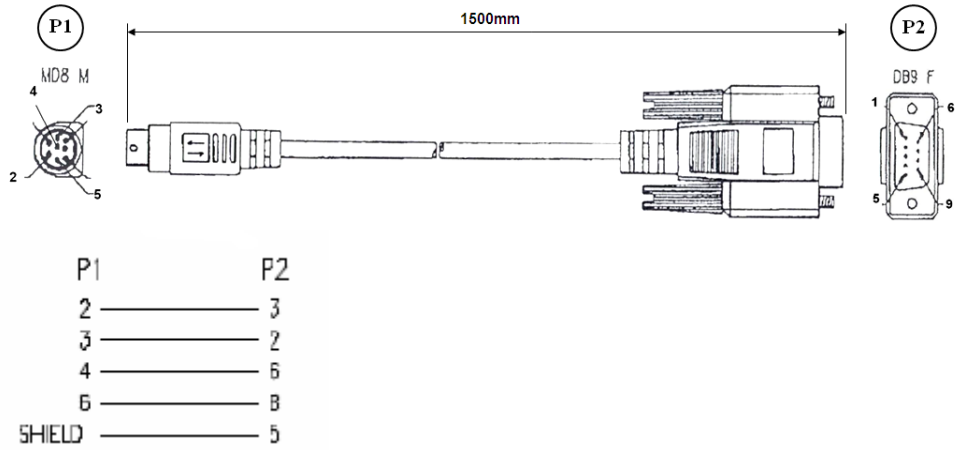


Figure 125: Cable configuration HW121/HW131 COM2

Pin Layout CS121 COM1:

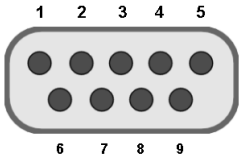


Figure 126: External D-SUB 9-polig male

Pin1:	DCD	Pin6:	DSR
Pin2:	RxD	Pin7:	RTS
Pin3	TxD	Pin8:	CTS
Pin4	DTR	Pin9:	RI
Pin5	GND		

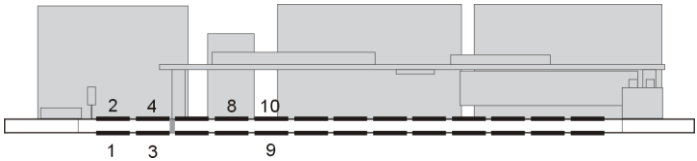


Figure 127: Slot version: Circuit board connection

Pin1: -> GND
Pin2: -> VDD
Pin3: -> TxD
Pin4: -> RxD
Pin9: -> GND
Pin8 connected with Pin 10

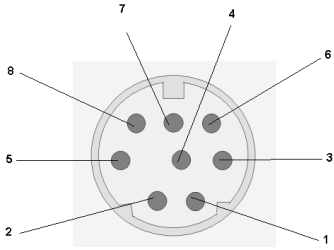


Figure 128: Pin COM2 Mini-DIN 8 pol female

Mini DIN 8 socket RS-232:

Pin1: -> DCD
Pin2: -> RxD
Pin3: -> TxD
Pin4: -> DTR
Pin5: -> DSR
Pin6: -> RTS
Pin7: -> CTS
Pin8: -> RI
Schirm -> GND

RS-485 (optional):

Pin1: -> RS485/B(+)
Pin5: -> RS485/A(-)

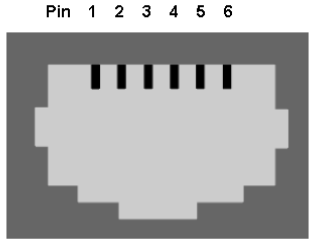


Figure 129: AUX-Port (Hardware Revision 1.1 = from Serial numbers 0121-1203, 0122-00198, 0123-00564 onwards) RJ11 6-pol

Pin1: -> +3,3V
Pin2: -> Input/Output 1
Pin3: -> Input/Output 2
Pin4: -> Input/Output 3
Pin5: -> Input/Output 4
Pin6: -> GND

The maximum input voltage is 3,3V. The input signals may be fed from external power sources or feed directly from Pin 1. If the external power supply delivers more than 5V a pre-resistor has to be fitted. The input resistance of the input is 5,1 kΩ

When using a opto coupler switch, a Pull up resistor of 1,5kOhm has to be used.

Output-voltage: If configured as OUTPUT, every Pin delivers 3.3 Volt/10mA.

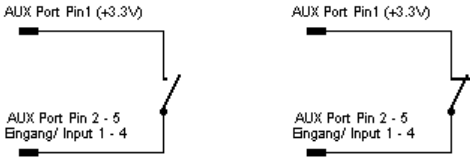


Figure 130: Example (Inputs): Opener or closer contact (only on hardware model CS121)

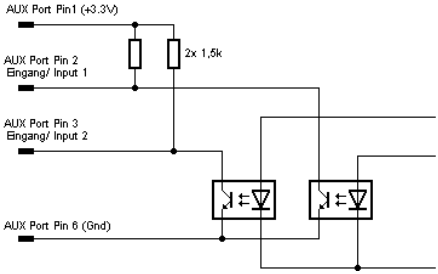


Figure 131: Opto coupler logic

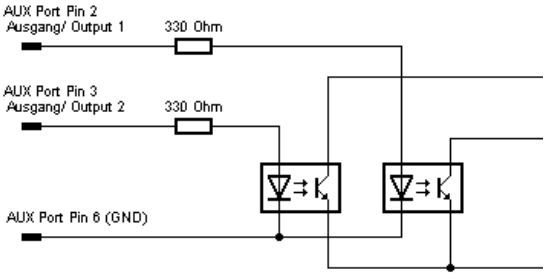


Figure 132: Example (Outputs)

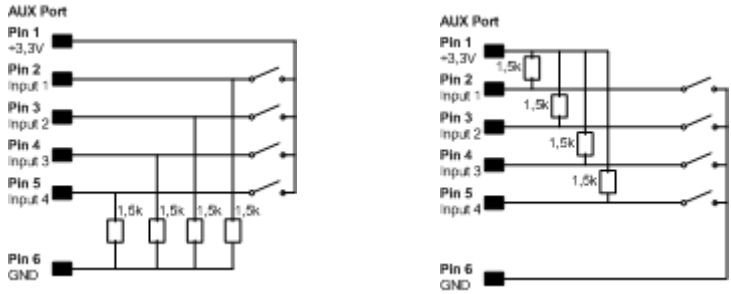


Figure 133: Examples: AUX Input on hardware model CS131 only, left side "pull-down", right side "pull-up" configuration

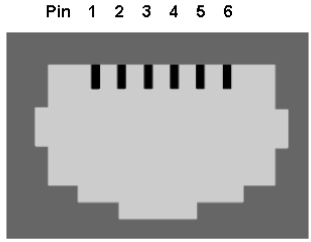


Figure 134: AUX Port Assignment

AUX port assignment for CS121 HW131 L from serial number 0121-10417 and CS121 HW131 SC from serial number 0123-09428:

PIN 1: 3,3V
PIN 2: AUX port 0: disposable
PIN 3: AUX port 1: disposable
PIN 4: AUX port 2: RX from COM3 (input)
PIN 5: AUX port 3: TX from COM3 (output)
PIN 6: GND

D. MODBUS Interface

D.1. General information

For remote control and monitoring of devices the MODBUS interface in each CS121 M can read out measurement values, events, status and other information in a master-slave protocol.

Note: Please note that not all UPS models support all or specific measurement values (e.g. battery low).

Communication Parameters:

ASCII Mode works at CS131 & CS121 platforms with communcation parameters 7/E/2, or 7/E/1 or with 7/N/2 from baudrate 1200 to 38400. We recommend for ASCII the use of 7/N/2 and the highest baudrate supported by your device.

RTU Mode works at CS131 & CS121 platforms with communcation parameters 8/E/1 or 8/N/2 or 8/N/1 or 8/E/2 or 8/O/2 or with 8/O/1 from baudrate 1200 to 38400. We recommend for RTU the use of 8/E/1 and the highest baudrate supported by your device.

MODBUS Parameter

Modus	Parität	DataBits	StoppBits
RTU	None	8	1
RTU	Even	8	1
RTU	Odd	8	1
ASCII	None	7	2
ASCII	Even	7	1
ASCII	Odd	7	1

If you receive faulty answers (Timeout Errors, Transaction ID Errors, Write Errors etc.), it may be, that the polling cycle was defined to fast. This causes the non answered polling requests or even a reboot of the CS121 through the integrated Watchdog, because the system is overloaded. Further on it can come to delayed answers during the MODBUS over IP or rather RS485 polling due to traffic into the bus or network, because the CS121 is a multi device, which has to handle several tasks at the same time.

NOTE: Please define a **response timeout** of at least 2000ms (at a fast MODBUS over IP or RS485 network/bus or rather higher accordingly, e.g. 4000ms at slow connections). The timeout has to be increased until the errors stay out.

D.2. Available Modbus Function Codes

Implemented MODBUS functions in the CS121 M units:

01H	Read Coils
02H	Read Discrete Inputs
03H	Read Holding Registers
04H	Read Input Registers
05H	Write Single Coil

Which functions are supported depends on the connected UPS. For standard UPS only functions 03H and 04H are available. In this case the CS121 M makes no difference between function 03H and 04H. The baud rate is adjustable up to 38400 Baud.

Note: Please note that the MODBUS adapter client allows a timeout of 40ms at 9600 baud for one value.

D.3. Exception Codes

Except for broadcast messages, when a master device sends a query to a slave device it expects a normal response. One of four possible events can occur from the master's query:

If the slave device receives the query without a communication error, and can handle the query normally, it returns a normal response.

If the slave does not receive the query due to a communication error, no response is returned. The master program will eventually process a timeout condition for the query.

If the slave receives the query, but detects a communication error parity, LRC, or CRC, no response is returned. The master program will eventually process a timeout condition for the query.

If the slave receives the query without a communication error, but cannot handle it (for example, if the request is to read a non existent register the slave will return an exception response informing the master of the nature of the error.

Available Exception codes:

Code	Meaning
01H	Illegal Function: The command received in the query is not defined.
02H	Illegal Address: The address received in the query is not defined for the slave.
04H	Slave Device Failure: Internal slave device error.

D.4. MODBUS Modes in the CS121 M (ASCII and RTU)

MODBUS Command

The following tables contain the general command descriptions and examples with ASCII and RTU framing.

Read Words (Functions 03h and 04h)

For the CS121 there is normally no difference between these two functions.

Query:

slave no	function code	address of first word to read		word count		Checksum LRC or CRC
1 byte	1 byte	High byte	Low byte	High byte	Low byte	1 or 2 byte(s)

Answer:

slave no	function code	Byte count	high byte of first word	low byte of first word	bytes with contents of n words	Checksum LRC or CRC
1 byte	1 byte	1 byte	1 byte	1 byte	n * 2 bytes	1 or 2 byte(s)

Example: Read Words, Function 04h, ASCII Mode

Read one word at address 63h (= 99 decimal):

Query:

Byte	1	2, 3	4, 5	6, 7	8, 9	10, 11	12, 13	14, 15	16	17
Meaning	Leading colon	Slave number	Function code	address of first word to read		word count to read		LRC	Carriage return	line feed LF
				high byte	low byte	high byte	low byte			
ASCII	:	0 1	0 4	0 0	6 3	0 0	0 1	9 7	<CR>	<LF>
HEX	[3A]	[30][31]	[30][34]	[30][30]	[36][33]	[30][30]	[30][31]	[39][37]	[0D]	[0A]

Answer:

Byte	1	2, 3	4, 5	6, 7	8, 9	10, 11	12, 13	14	15
Meaning	leading colon	Slave number	function code	byte count	contents of the word	LRC	carriage return	line feed LF	
					high	low			

					byte	byte			
ASCII	:	0 1	0 4	0 2	1 2	3 4	B 3	<CR>	<LF>
HEX	[3A]	[30][31]	[30][34]	[30][32]	[31][32]	[33][34]	[42][33]	[0D]	[0A]

ASCII: Data, which will send over the link as ASCII characters.

HEX: Hexadecimal values of the data

→ The word at address contains the value 1234h = 4660 decimal.
Example: Read Words, Function 04h, RTU Mode

Read one word at address 63h (= 99 decimal):

Query:

Byte		1	2	3	4	5	6	7	8	
Meaning	silent interval >= 3.5 characters	Slave number	function code	address of first word to read		word count to read		CRC		silent interval >= 3.5 characters
				high byte	low byte	high byte	low byte	low byte	High byte	
RTU HEX		[01]	[04]	[00]	[63]	[00]	[01]	[C1]	[D4]	

Answer:

Byte		1	2	3	4	5	6	7
Meaning	silent interval >= 3.5 characters	Slave number	function code	byte count	Contents of the word	CRC	Silent interval >= 3.5 characters	
RTU HEX					high byte	low byte	low byte	high byte
		[01]	[04]	[02]	[12]	[34]	[B4]	[47]

→ The word at address contains the value 1234h = 4660 decimal.

D.5. UPS Parameter

Standard UPS – Address Description

Please note that this is just an example for a typical UPS, not every UPS has all these values, some UPS may have more, some less. Please contact your UPS manufacturer to check which variables are available and which requests are not supported.

Note: “Type U/S”: this defines whether the answer has an algebraic sign (math. +/-) or not. U means “unsigned”. S means “signed”, this answer may be positive or negative.

Address	Type	Function	Name	Description	Length
100	U	3 / 4	OUTP0WER0	Outpower Phase 1	1
101	U	3 / 4	OUTP0WER1	Outpower Phase 2 %	1
102	U	3 / 4	OUTP0WER2	Outpower Phase 3 %	1
103	U	3 / 4	BATTCAP	Battery Capacity %	1
104	S	3 / 4	INVOLT0	Input Voltage Phase 1 V	1
105	S	3 / 4	INVOLT1	Input Voltage Phase 2 V	1
106	S	3 / 4	INVOLT2	Input Voltage Phase 3 V	1
107	S	3 / 4	TEMPDEG	Temperature C°	1
108	S	3 / 4	AUTONOMTIME	Autonomy Time minutes	1
109	U	3 / 4	STATUS (e. g. UPS normal = “4”, Powerfail = “12”, Battery test running = “68”, Bypass = “5”)	UPS Status (ASCII HEX) Please note UPSMAN status bytes table below	1

10	S	3 / 4	BATTVOLT	Battery Voltage V	1
111	U	3 / 4	INFREQ0	Input Frequency Hz Phase 1	1
112	U	3 / 4	INFREQ1	Input Frequency Hz Phase 2	1
113	U	3 / 4	INFREQ2	Input Frequency Hz Phase 3	1
114	U	3 / 4	CNT_PF	Powerfail Counter	1
115	U	3 / 4	Alarm Battery Bad	1 = active; 0 = not active	1
116	U	3 / 4	Alarm: On Battery	1 = active; 0 = not active	1
117	U	3 / 4	Alarm: Battery Low	1 = active; 0 = not active	1
118	U	3 / 4	Alarm: Battery Depleted	1 = active; 0 = not active	1
119	U	3 / 4	Alarm: Over temperature	1 = active; 0 = not active	1
120	U	3 / 4	Alarm: Input Bad	1 = active; 0 = not active	1
121	U	3 / 4	Alarm: Output Bad	1 = active; 0 = not active	1
122	U	3 / 4	Alarm: Output Overload	1 = active; 0 = not active	1
123	U	3 / 4	Alarm: On Bypass	1 = active; 0 = not active	1
124	U	3 / 4	Alarm: Bypass Bad	1 = active; 0 = not active	1
125	U	3 / 4	Alarm: Output Off as requested.	1 = active; 0 = not active	1
126	U	3 / 4	Alarm: UPS Off as requested.	1 = active; 0 = not active	1
127	U	3 / 4	Alarm: Charger Failed	1 = active; 0 = not active	1
128	U	3 / 4	Alarm: UPS Output Off	1 = active; 0 = not active	1
129	U	3 / 4	Alarm: UPS System Off	1 = active; 0 = not active	1
130	U	3 / 4	Alarm: Fan Failure	1 = active; 0 = not active	1
131	U	3 / 4	Alarm: fuse failure	1 = active; 0 = not active	1
132	U	3 / 4	Alarm: general fault	1 = active; 0 = not active	1
133	U	3 / 4	Alarm: diagnose test failed	1 = active; 0 = not active	1
134	U	3 / 4	Alarm: communication lost	1 = active; 0 = not active	1
135	U	3 / 4	Alarm: awaiting power	1 = active; 0 = not active	1
136	U	3 / 4	Alarm: shutdown pending	1 = active; 0 = not active	1
137	U	3 / 4	Alarm: shutdown imminent	1 = active; 0 = not active	1
138	U	3 / 4	Alarm: test in progress	1 = active; 0 = not active	1
139	U	3 / 4	AUX Port 1	1 = active (high) 0 = not active (low)	1
140	U	3 / 4	AUX Port 2	1 = active (high) 0 = not active (low)	1
141	U	3 / 4	AUX Port 3	1 = active (high) 0 = not active (low)	1
142	U	3 / 4	AUX Port 4	1 = active (high) 0 = not active (low)	1
143	U	3 / 4	Sensormanager/SMTCOM sensor 1	Analog value	1
144	U	3 / 4	Sensormanager/SMTHCOM sensor 2	Analog value	1
145	U	3 / 4	Sensormanager sensor 3	Analog value	1
146	U	3 / 4	Sensormanager sensor 4	Analog value	1
147	U	3 / 4	Sensormanager sensor 5	Analog value	1
148	U	3 / 4	Sensormanager sensor 6	Analog value	1
149	U	3 / 4	Sensormanager sensor 7	Analog value	1
150	U	3 / 4	Sensormanager sensor 8	Analog value	1

Section OEM	**NEWAVE UPS**		

99	U	1 6	Timesyncronization signal	Command 16 (write) : When this signal is set, the CS121 sets the internal clock to 01:00 of the same day. Command 3 or 4 (read) is not allowed.	1
139	U	3 / 4	Manual Bypass Switch Closed	0 = open 1 = closed	1
140	U	3 / 4	OUTPUT_VOLT0	Outputvoltage Phase 1	1
141	U	3 / 4	OUTPUT_VOLT1	Outputvoltage Phase 2	1
142	U	3 / 4	OUTPUT_VOLT2	Outputvoltage Phase 3	1
143	U	3 / 4	OutputCurrent Phase A * 10	Output Current Phase 1 in Ampere *10	1
144	U	3 / 4	OutputCurrent Phase B * 10	Output Current Phase 1 in Ampere *10	1
145	U	3 / 4	OutputCurrent Phase C * 10	Output Current Phase 1 in Ampere *10	1
146	U	3 / 4	xid3017 Bits 0-15	Statusbit of UPS 1 = true, 0 = false	1
147	U	3 / 4	xid3017 Bits 16-31	Statusbit, for details please contact NEWAVE	1
148	U	3 / 4	xid645 Bits 0-15	Alarmbit, for details please contact NEWAVE	1
149	U	3 / 4	xid645 Bits 16-31	Alarmbit, for details please contact NEWAVE	1
150	U	3 / 4	xid645 Bits 32-47	Alarmbit, for details please contact NEWAVE	1
151	U	3 / 4	xid645 Bits 48-63	Alarmbit, for details please contact NEWAVE	1
152	U	3 / 4	Sensormanager/SMTCOM sensor 1	Analog value	1
153	U	3 / 4	Sensormanager/SMTHCOM sensor 2	Analog value	1
154	U	3 / 4	Sensormanager sensor 3	Analog value	1
155	U	3 / 4	Sensormanager sensor 4	Analog value	1
156	U	3 / 4	Sensormanager sensor 5	Analog value	1
157	U	3 / 4	Sensormanager sensor 6	Analog value	1
158	U	3 / 4	Sensormanager sensor 7	Analog value	1
159	U	3 / 4	Sensormanager sensor 8	Analog value	1
160	U	3 / 4	TrueOutputPower Phase A in KW	True Output Power Current Phase 1 in Kilowatt	1
161	U	3 / 4	TrueOutputPower Phase A in KW	True Output Power Current Phase 1 in Kilowatt	1
162	U	3 / 4	TrueOutputPower Phase A in KW	True Output Power Current Phase 1 in Kilowatt	1
163	U	3 / 4	AUX Port 1	1 = active (high) 0 = not active (low)	1
164	U	3 / 4	AUX Port 2	1 = active (high) 0 = not active (low)	1
165	U	3 / 4	AUX Port 3	1 = active (high) 0 = not active (low)	1
166	U	3 / 4	AUX Port 4	1 = active (high) 0 = not active (low)	1

Section OEM			MASTERGUARD		
139	U	3 / 4	PXWARN		2
141	U	3 / 4	FAULT CODE 1		1
142	U	3 / 4	FAULT CODE 2		1
143	U	3 / 4	FAULT CODE 3		1
144	U	3 / 4	FAULT CODE 4		1
145	U	3 / 4	BADBATTBLOCK 1		1
146	U	3 / 4	BADBATTBLOCK 1		1
147	U	3 / 4	BADBATTBLOCK 1		1
148	U	3 / 4	BADBATTBLOCK 1		1
149	U	3 / 4	BADBATTBLOCK 1		1
150	U	3 / 4	BADBATTBLOCK 1		1

Section OEM			RITTAL		
Digital Input Status(DI)					
0	bit	2	Bypass working	Status 0: Normal, Status 1: Alert	1
1	bit	2	Bypass Interruption	Status 0: Normal, Status 1: Alert	1
2	bit	2	Rectifier Failure	Status 0: Normal, Status 1: Alert	1
3	bit	2	Inverter Failure	Status 0: Normal, Status 1: Alert	1
4	bit	2	Over Temperature	Status 0: Normal, Status 1: Alert	1
5	bit	2	Over Load	Status 0: Normal, Status 1: Alert	1
6	bit	2	0	Status 0: Normal, Status 1: Alert	1
7	bit	2	Battery Voltage too Low	Status 0: Normal, Status 1: Alert	1
8	bit	2	Fuse broken	Status 0: Normal, Status 1: Alert	1
9	bit	2	Battery discharging	Status 0: Normal, Status 1: Alert	1
10	bit	2	0	Status 0: Floating charge Status 1: Instant charging	1
11~30	bit	2	For future expansion		1
After 31	bit	2	Venders own definition		1
Analog Measurement point (AI)					
00	word	4	U in R phase input voltage	0.1 Volt	2
01	word	4	U in S phase input voltage	0.1 Volt	2
02	word	4	U in T phase input voltage	0.1 Volt	2
03	word	4	I in R phase input current	0.1A	2
04	word	4	I in S phase input current	0.1A	2
05	word	4	I in T phase input current	0.1A	2

06	word	4	F input frequency	0.1Hz	2
07	word	4	U out R phase output voltage	0.1 Volt	2
08	word	4	U out S phase output voltage	0.1 Volt	2
09	word	4	U out T phase output voltage	0.1 Volt	2
10	word	4	I out R phase output current	0.1A	2
11	word	4	I out S phase output current	0.1A	2
12	word	4	I out T phase output current	0.1A	2
13	word	4	P out output power	0.1kVA	2
14	word	4	P out output power	0.1kW	2
15	word	4	PF output power factor	0.01Cos	2
16	word	4	U Bypass R phase voltage	0.1 Volt	2
17	word	4	U Bypass S phase voltage	0.1 Volt	2
18	word	4	U Bypass T phase voltage	0.1 Volt	
19	word	4	F out output frequency	0.1Hz	
20	word	4	U Bat battery voltage	0.1 Volt	
21	word	4	I charch Bat battery charging/discharging	0.1A	
22	word	4	Temp 1 battery temperature	0.1degC	
23	word	4	Temp 2 battery temperature	0.1degC	
24	word	4	Temp 3 battery temperature	0.1degC	
25	word	4	Temp 4 battery temperature	0.1degC	
26	word	4	Temp 5 UPS shelf temperature	0.1degC	
Digital output (DO) **Function 1 to read data; 5 to control the function**					
0	bit	1 / 5	UPS Turn On		
1	bit	1 / 5	UPS Shut down		
2	bit	1 / 5	Alarm Reset		
3	bit	1 / 5	Battery Instant Charging		
4	bit	1 / 5	Battery Floating Charging		
5~10	bit		For future expansion		
After			Vender self definition		

Section OEM			Rittal	New from CS121 firmware version 4.22.14	
139	U	3 / 4	Manual Bypass Switch Closed	0 = open 1 = closed	1
140	U	3 / 4	OUTPUT_VOLT0	Outputvoltage Phase 1	1
141	U	3 / 4	OUTPUT_VOLT1	Outputvoltage Phase 2	1
142	U	3 / 4	OUTPUT_VOLT2	Outputvoltage Phase 3	1
143	U	3 / 4	OutputCurrent Phase A * 10	Output Current Phase 1 in Ampere *10	1
144	U	3 / 4	OutputCurrent Phase B * 10	Output Current Phase 1 in Ampere *10	1
145	U	3 / 4	OutputCurrent Phase C * 10	Output Current Phase 1 in Ampere *10	1
146	U	3 / 4	xid3017 Bits 0-15	Statusbit of UPS 1 = true, 0 = false	1
147	U	3 / 4	xid3017 Bits 16-31	Statusbit, for details please contact NEWAVE	1
148	U	3 / 4	xid645 Bits 0-15	Alarmbit, for details please contact NEWAVE	1
149	U	3 / 4	xid645 Bits 16-31	Alarmbit, for details please contact NEWAVE	1
150	U	3 / 4	xid645 Bits 32-47	Alarmbit, for details please contact NEWAVE	1
151	U	3 / 4	xid645 Bits 48-63	Alarmbit, for details please contact NEWAVE	1
152	U	3 / 4	Sensormanager/SMTCOM sensor 1	Analog value	1
153	U	3 / 4	Sensormanager/SMTHCOM sensor 2	Analog value	1
154	U	3 / 4	Sensormanager sensor 3	Analog value	1
155	U	3 / 4	Sensormanager sensor 4	Analog value	1
156	U	3 / 4	Sensormanager sensor 5	Analog value	1
157	U	3 / 4	Sensormanager sensor 6	Analog value	1
158	U	3 / 4	Sensormanager sensor 7	Analog value	1
159	U	3 / 4	Sensormanager sensor 8	Analog value	1
160	U	3 / 4	TrueOutputPower Phase A in KW	True Output Power Current Phase 1 in Kilowatt	1
161	U	3 / 4	TrueOutputPower Phase A in KW	True Output Power Current Phase 1 in Kilowatt	1
162	U	3 / 4	TrueOutputPower Phase A in KW	True Output Power Current Phase 1 in Kilowatt	1
163	U	3 / 4	AUX Port 1	1 = active (high) 0 = not active (low)	1
164	U	3 / 4	AUX Port 2	1 = active (high) 0 = not active (low)	1
165	U	3 / 4	AUX Port 3	1 = active (high) 0 = not active (low)	1
166	U	3 / 4	AUX Port 4	1 = active (high) 0 = not active (low)	1

Section OEM	Netminder for all LT and MD types	

Address	Type	Function	Name	Description	Length
100	U	3/4	INVOLT	Input Voltage	1
101	U	3/4	OUTPUTVOLT	Output Voltage	1
102	U	3/4	BATTVOLT	Battery Voltage	1
103	U	3/4	OUTPUTCURR	Output Current	1
104	U	3/4	LOADPERC	Load (%)	1
105	U	3/4	OUTPUTPOW	Output Power in W	1
106	U	3/4	KVA	KVA	1
107	U	3/4	FREQUENCY	Frequency	1
108	U	3/4	CS121UPSSTAT	CS121 UPS Status	1
109	U	3/4	Alarm: Battery Bad	1 = active; 0 = not active	1
110	U	3/4	Alarm: On Battery	1 = active; 0 = not active	1
111	U	3/4	Alarm: Battery Low	1 = active; 0 = not active	1
112	U	3/4	Alarm: Battery Depleted	1 = active; 0 = not active	1
113	U	3/4	Alarm: Overtemperature	1 = active; 0 = not active	1
114	U	3/4	Alarm: Input Bad	1 = active; 0 = not active	1
115	U	3/4	Alarm: Output Bad	1 = active; 0 = not active	1
116	U	3/4	Alarm: Output Overload	1 = active; 0 = not active	1
117	U	3/4	Alarm: On Bypass	1 = active; 0 = not active	1
118	U	3/4	Alarm: Bypass Bad	1 = active; 0 = not active	1
119	U	3/4	Alarm: Output Off As Requested	1 = active; 0 = not active	1
120	U	3/4	Alarm: UPS Off As Requested	1 = active; 0 = not active	1
121	U	3/4	Alarm: Charger Failed	1 = active; 0 = not active	1
122	U	3/4	Alarm: UPS Output Off	1 = active; 0 = not active	1
123	U	3/4	Alarm: UPS System Off	1 = active; 0 = not active	1
124	U	3/4	Alarm: Fan Failure	1 = active; 0 = not active	1
125	U	3/4	Alarm: Fuse Failure	1 = active; 0 = not active	1
126	U	3/4	Alarm: General Fault	1 = active; 0 = not active	1
127	U	3/4	Alarm: Diagnosis Test Failed	1 = active; 0 = not active	1

128	U	3/4	Alarm: Communication Lost	1 = active; 0 = not active	1
129	U	3/4	Alarm: Awaiting Power	1 = active; 0 = not active	1
130	U	3/4	Alarm: Shutdown Pending	1 = active; 0 = not active	1
131	U	3/4	Alarm: Shutdown Imminent	1 = active; 0 = not active	1
132	U	3/4	Alarm: Test In Progress	1 = active ; 0 = not active	1
133	U	3/4	AUX Port 1	1 = active (high) ; 0 = not active (low)	1
134	U	3/4	AUX Port 2	1 = active (high) ; 0 = not active (low)	1
135	U	3/4	AUX Port 3	1 = active (high) ; 0 = not active (low)	1
136	U	3/4	AUX Port 4	1 = active (high) ; 0 = not active (low)	1
137	U	3/4	SensorManager/SMTH_COM, Sensor 1	Analog Value	1
138	U	3/4	SensorManager/SMTH_COM, Sensor 2	Analog Value	1
139	U	3/4	SensorManager/Sensor 3	Analog Value	1
140	U	3/4	SensorManager/Sensor 4	Analog Value	1
141	U	3/4	SensorManager/Sensor 5	Analog Value	1
142	U	3/4	SensorManager/Sensor 6	Analog Value	1
143	U	3/4	SensorManager/Sensor 7	Analog Value	1
144	U	3/4	SensorManager/Sensor 8	Analog Value	1

Section OEM Netminder for all other types

Address	Type	Function	Name	Description	Length
100	U	3/4	INVOLT	Input Voltage (l1-n)	1
101	U	3/4	INVOLT	Input Voltage (l2-n)	1
102	U	3/4	INVOLT	Input Voltage (l1-l2)	1
103	U	3/4	OUTPUTVOLT	Output Voltage (l1-n)	1
104	U	3/4	OUTPUTVOLT	Output Voltage (l2-n)	1

105	U	3/4	OUTPUTVOLT	Output Voltage /(l1-l2)	1
106	U	3/4	OUTPUTCURR	Output Current (l1-n)	1
107	U	3/4	OUTPUTCURR	Output Current (l2-n)	1
108	U	3/4	OUTPUTWAT	Output Watts (l1-n)	1
109	U	3/4	OUTPUTWAT	Output Watts (l2-n)	1
110	U	3/4	OUTPUTWAT	Output Watts (l1-l2)	1
111	U	3/4	OUTPUTWATTOT	Output watts (total)	1
112	U	3/4	OUTPUTVA	Output VA (l1-n)	1
113	U	3/4	OUTPUTVA	Output VA (l2-n)	1
114	U	3/4	OUTPUTVA	Output VA (l1-l2)	1
115	U	3/4	OUTPUTVATOT	Output VA (total)	1
116	U	3/4	OUTPUTLOAD	Output Load (l1-n)	1
117	U	3/4	OUTPUTLOAD	Output Load (l2-n)	1
118	U	3/4	OUTPUTFREQ	Output Frequency	1
119	U	3/4	BATTVOLT	Battery Voltage	1
120	U	3/4	PERCBATT	Percentage Battery	1
121	U	3/4	DCCHARGECURR	DC Charging Current	1
122	U	3/4	CS121UPSSTAT	CS121 UPS Status	1
123	U	3/4	Alarm: Battery Bad	1 = active; 0 = not active	1
124	U	3/4	Alarm: On Battery	1 = active; 0 = not active	1
125	U	3/4	Alarm: Battery Low	1 = active; 0 = not active	1
126	U	3/4	Alarm: Battery Depleted	1 = active; 0 = not active	1
127	U	3/4	Alarm: Overtemperature	1 = active; 0 = not active	1
128	U	3/4	Alarm: Input Bad	1 = active; 0 = not active	1
129	U	3/4	Alarm: Output Bad	1 = active; 0 = not active	1
130	U	3/4	Alarm: Output Overload	1 = active; 0 = not active	1
131	U	3/4	Alarm: On Bypass	1 = active; 0 = not active	1
132	U	3/4	Alarm: Bypass Bad	1 = active; 0 = not active	1
133	U	3/4	Alarm: Output Off As Requested	1 = active; 0 = not active	1
134	U	3/4	Alarm: UPS Off As Requested	1 = active; 0 = not active	1
135	U	3/4	Alarm: Charger Failed	1 = active; 0 = not active	1
136	U	3/4	Alarm: UPS Output Off	1 = active; 0 = not active	1

137	U	3/4	Alarm: UPS System Off	1 = active; 0 = not active	1
138	U	3/4	Alarm: Fan Failure	1 = active; 0 = not active	1
139	U	3/4	Alarm: Fuse Failure	1 = active; 0 = not active	1
140	U	3/4	Alarm: General Fault	1 = active; 0 = not active	1
141	U	3/4	Alarm: Diagnosis Test Failed	1 = active; 0 = not active	1
142	U	3/4	Alarm: Communication Lost	1 = active; 0 = not active	1
143	U	3/4	Alarm: Awaiting Power	1 = active; 0 = not active	1
144	U	3/4	Alarm: Shutdown Pending	1 = active; 0 = not active	1
145	U	3/4	Alarm: Shutdown Imminent	1 = active; 0 = not active	1
146	U	3/4	Alarm: Test In Progress	1 = active; 0 = not active	1
147	U	3/4	AUX Port 1	1 = active (high) ; 0 = not active (low)	1
148	U	3/4	AUX Port 2	1 = active (high) ; 0 = not active (low)	1
149	U	3/4	AUX Port 3	1 = active (high) ; 0 = not active (low)	1
150	U	3/4	AUX Port 4	1 = active (high) ; 0 = not active (low)	1
151	U	3/4	SensorManager/SMTH_COM, Sensor 1	Analog Value	1
152	U	3/4	SensorManager/SMTH_COM, Sensor 2	Analog Value	1
153	U	3/4	SensorManager/Sensor 3	Analog Value	1
154	U	3/4	SensorManager/Sensor 4	Analog Value	1
155	U	3/4	SensorManager/Sensor 5	Analog Value	1
156	U	3/4	SensorManager/Sensor 6	Analog Value	1
157	U	3/4	SensorManager/Sensor 7	Analog Value	1
158	U	3/4	SensorManager/Sensor 8	Analog Value	1

Section	**POWERTRONIX**			

OEM				
		MIZAR		
Adresse	Name	ALCOR	QUASAR	SUPERNOVAE
100	Outpower Phase 1 %	x	x	x
101	Outpower Phase 2 %	x	x	x
102	Outpower Phase 3 %	x	x	x
103	Battery Capacity %	x	x	x
104	Input Voltage Phase 1 V	x	x	x
105	Input Voltage Phase 2 V	x	x	x
106	Input Voltage Phase 3 V	x	x	x
107	Temperature °C	not supported	x	x
108	Autonomy Time minutes	x	x	x
109	UPS Status (ASCII Hex)	x	x	x
110	Battery Voltage V	x	x	x
111	Input Frequency Phase 1 Hz	not supported	x	not supported
112	Input Frequency Phase 2 Hz	not supported	x	not supported
113	Input Frequency Phase 3 Hz	not supported	x	not supported
114	Powerfail Counter	x	x	x
115	Alarm: Battery Bad	x	x	x
116	Alarm: On Battery	x	x	x
117	Alarm: Battery Low	not supported	not supported	x
118	Alarm: Battery Depleted	x	not supported	x
119	Alarm: Overtemperature	x	not supported	x
120	Alarm: Input Bad	x	x	x
121	Alarm: Output Bad	not supported	x	not supported
122	Alarm: Output Overload	x	x	x
123	Alarm: On Bypass	x	x	x
124	Alarm: Bypass Bad	x	x	x
125	Alarm: Output Off As Requested	x	x	x
126	Alarm: UPS Off As Requested	x	x	x
127	Alarm: Charger Failed		x	x

128	Alarm: UPS Output Off	x	x	x
129	Alarm: UPS Sytem Off	not supported	x	not supported
130	Alarm: Fan Failure	x	not supported	x
131	Alarm: Fuse Failure	not supported	not supported	not supported
132	Alarm: General Fault	x	x	x
133	Alarm: Diagnose Test Failed	not supported	not supported	not supported
134	Alarm: Communication Lost	x	x	x
135	Alarm: Awaiting Power	not supported	not supported	not supported
136	Alarm: Shutdown Pending	not supported	not supported	not supported
137	Alarm: Shutdown Imminent	not supported	not supported	not supported
138	Alarm: Test In Progress	x	not supported	not supported
139	AUX Port 1	x	x	x
140	AUX Port 2	x	x	x
141	AUX Port 3	x	x	x
142	AUX Port 4	x	x	x

Section			**Transfer Switches**	**All transfer switch vendors, except PILLER**	
1	U	3 / 4	Sources Asynchronous	Warning, input current difference, switching might not be possible	1
2	U	3 / 4	Static Switch A Failure	Alarm, switching failure	1
3	U	3 / 4	Static Switch B Failure	Alarm, switching failure	1
4	U	3 / 4	On Static Switch A	Supplied from input A	1
5	U	3 / 4	On Static Switch B	Supplied from input B	1
6	U	3 / 4	On Manual Bypass A	Supplied via bypass from input A	1
7	U	3 / 4	On Manual Bypass A	Supplied via bypass from input B	1
8	U	3 / 4	Source A Failure	Alarm, input A failure, problem with voltage	1
9	U	3 / 4	Source B Failure	Alarm, input B failure, problem with voltage	1
10	U	3 / 4	General Fault	General alarm	1
11	U	3 / 4	Redundancy Lost	Redundancy lost,	1
12	U	3 / 4	Output Overload	To much load	1
13	U	3 / 4	Output Failure	Output failure	1

Other OEM's	->See **OEM MODBUS documentation**	

D.6. UPSMAN Status Bytes - Standard Device Status Bits

UPS Status	Hex-Value	Dec-Value	Description
UPS_SB_BYPASS_MODE	0x0001	1	power piped thru
UPS_SB_SHUTDOWN	0x0002	2	shutdown ups
UPS_SB_OUTPUT_ACT	0x0004	4	inverter on = UPS OK
UPS_SB_BACKUP_MODE	0x0008	8	battery power
UPS_SB_BATTERY_LOW	0x0010	16	low battery err
UPS_SB_OVER_TEMP	0x0020	32	over temp err
UPS_SB_TEST_ACT	0x0040	64	test in progress
UPS_SB_INPUT_HIGH	0x0080	128	over power err
UPS_SB_OUTPUT_HIGH	0x0100	256	over load err
UPS_SB_INVERTER_FAILURE	0x0200	512	Inverter error
UPS_SB_BATTERY_BAD	0x0400	1024	Battery error
UPS_SB_ECO_MODE	0x0800	2048	eco - bypass
UPS_SB_INVERTER_WARN	0x1000	4096	eco - bypass
UPS_SB_UPS_FAILED	0x2000	8192	prser flag
UPS_SB_COMM_LOST	0x4000	16384	for snmp
UPS_SB_DVG_ALARM	0x8000	32768	SiteManager/SiteMonitor

Example (decimal):
STATUS= „5" means UPS_SB_OUTPUT_ACT (4) + UPS_SB_BYPASS_MODE (1) are active ! = UPS on Bypass!

STATUS= „12" means UPS_SB_OUTPUT_ACT (4) + UPS_SB_BACKUP_MODE (8) are active ! = UPS Powerfail!

STATUS= „22" means UPS_SB_OUTPUT_ACT (4) + UPS_SB_BACKUP_MODE (8) + UPS_SB_BATTERY_LOW (10) are active ! = UPS Powerfail and Battery low!

STATUS= „4" means UPS_SB_OUTPUT_ACT (4) + no other alarms = UPS OK

D.7. Bus termination

It is necessary to set the last bus device on the RS-485 Bus jumper for the bus termination. The jumper is already set in newly delivered adapters. Please remove the 4 screws at the underside of the adapter in order to open the box. You will find the jumper J1 near the network

connector, near the PCB shows a “+” symbol. (see fig.) Default is OFF = CS121 is NOT last device. To terminate the RS485 bus at your CS121, please close the Jumper.

Figure 135: MODBUS - Jumper

D.8. Configuration

Please use Telnet (network connection) for the configuration with the default IP address 10.10.10.10. Put DIP switch 1 into the “OFF” position. If you have a RS-232/ RS-485 converter available you can also use a HyperTerminal via COM2 with both DIP switches in the “OFF” position.

D.9. TCP/IP - UDP Ports

The following are ports of the CS121 SNMP Adapter. These are the ports that have to be made available in the Firewall in order to use all of the CS121 functions:

Echo	7/tcp
echo	7/udp
WOL	9/udp
ftp-data	20/tcp
ftp	21/tcp
telnet	23/tcp
smtp	25/tcp
http	80/tcp
snmp	161/udp
snmptrap	162/udp
time (rfc868)	37/tcp
time (sntp)	123/tcp
rccmd	6003
Upsmon	5769
Modbus over IP	502/tcp

Update flash 4000/udp

The UPSMON port 5769 is required for the following:

- UPSMON Windows
- RCCMD and UNMS II alive check
- Port forwarding (unblocking of several CS121 into the network via own ports into other networks)
- Support of all other commands and functions via UPSTCP

D.10. MODBUS Cables

The following cable (Cable 112) is used for connecting the Schneider Electrics TSX SCY CM6030 MODBUS device and the CS121 MODBUS adapter.

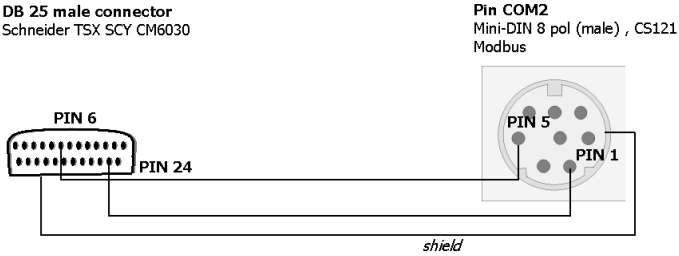


Figure 136: MODBUS - Cable 112

NOTE: it is very important that the Shield is connected to the MINI 8 housing and to the MODBUS requesting device common ground!

E. Available Variables of the CS121

Note: Not all variables are supported from all UPS-models. Please try the use of the variable to see, whether your UPS supports the variable or not.

Variable	Meaning
OUTPUT_VOLT	Output voltage - only supported from specified USV manufactures
OUTPUT_CURRENT	Output currency
SECSONBATT	Seconds, since the event power outage has been released
STATUS	Actual UPS state
INVOLT0	Input voltage, phase 1
INVOLT1	Input voltage, phase 2
INVOLT2	Input voltage, phase 3
INCURR	Input currency
BATTVOLT	Battery voltage
TEMPDEG	Ambient or operating temperature – depends on the UPS-Model
AUTONOMTIME	Power-on time left over under actual charge
BATTCAP	Capacity of the battery in percent
OUTPOWER0	Load in percent, phase 1
OUTPOWER1	Load in percent, phase 2
OUTPOWER2	Load in percent, phase 3
INFREQ0	Input frequency, phase 1
INFREQ1	Input frequency, phase 2
INFREQ2	Input frequency, phase 3
OUTFREQ0	Output frequency, phase 1
OUTFREQ1	Output frequency, phase 2

OUTFREQ2	Output frequency, phase 3
CONNECT	ID of the used UPS protocol
CABLE	ID of the used cable type
POWER	Configurated UPS Power
LOAD	Configurated Load
HOLDTIME	Configurated hold time
RECHARGETIME	Configurated time for a complete battery charging
MODEL	UPS model name
TIMEREMAIN	Resttime (AUTONOMTIME-POWERREMAIN)
LOCALTIME	Local timestamp
OUTPHASES	Output phase
INPHASES	Input phase
LOCATION	UPS-Adapter location
DATE	Date
TIME	Time
ATTACHED_DEVICES	Attached devices
BATTINSTDATE	Battery installation date
AGENTSOFTREV	Firmware version
MANUFACTURER	Manufacturer
TEMP1, …, TEMP8	Actual measurement for sensors 1-8, used for SensorMan settings only
TEMP1LOCATION, …, TEMP8LOCATION	Configurated sensor 1-8 location
TEMP1UNIT, …, TEMP8UNIT	Configurated sensor 1-8 unit
CUSTOM1TEXT, …, CUSTOM6TEXT	Configurated Custom Text 1-6

F. Pin layout of Input-sockets of the SENSORMANAGER unit

INPUT 1:

Pin 1 Input Voltage 9-24Volt +
Pin 2 Analog Channel 1 (0-10V+)
Pin 3 Analog Channel 5 (0-10V+)
Pin 4 Ground
Pin 5 OUTPUT: Open collector OUT 9-24 V, max. 30mA
Pin 6 INPUT: Digital Input 9-24V

INPUT 2:

Pin 1 Input Voltage 9-24Volt +
Pin 2 Analog Channel 2 (0-10V+)
Pin 3 Analog Channel 6 (0-10V+)

Pin 4 Ground
Pin 5 OUTPUT: Open collector OUT 9-24 V, max. 30mA
Pin 6 INPUT: Digital Input 9-24V

INPUT 3:

Pin 1 Input Voltage 9-24Volt +
Pin 2 Analog Channel 3 (0-10V+)
Pin 3 Analog Channel 7 (0-10V+)
Pin 4 Ground
Pin 5 OUTPUT: Open collector OUT 9-24 V, max. 30mA
Pin 6 INPUT: Digital Input 9-24V

INPUT 4:

Pin 1 Input Voltage 9-24 Volt +
Pin 2 Analog Channel 4 (0-10V+)
Pin 3 Analog Channel 8 (0-10V+)
Pin 4 Ground
Pin 5 OUTPUT: Open collector OUT 9-24 V, max. 30mA
Pin 6 INPUT: Digital Input 9-24

G. Events/Alarms of the CS121 – Description of the alarms

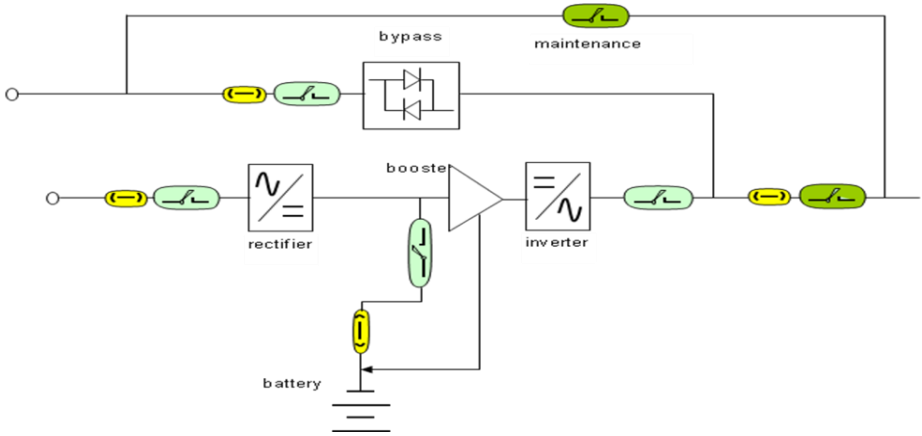
The Events/Alarms are different from UPS to UPS, depending on the UPS manufacturer. We are describing in the following example the Events/Alarms of a NEWAVE UPS, which are similar to most of the UPS. Anyway all alarms, which are not POWERFAIL, BATTERY LOW, SYSTEM SHUTDOWN, UPSMAN STARTED and AUX, you should advice your UPS manufacturer, because an UPS hardware failure might be present! The mentioned alarms are universal. The POWERFAIL and BATTERY LOW alarm require a reaction, e. g. the configuration of shutdowns of clients via RCCMD.

Event	Description
Powerfail	UPS is on battery and the autonomy time decreases. **ADVICE: The RCCMD shutdowns will be set into this alarm, to send shutdown signals to the clients, if the powerfail will last longer!**
Power Restored	Power supply restored
System Shutdown	This event is TRUE, if the remaining time is reached or rather undershot. That means the autonomy time is only available for seconds, the UPS shutdown is pending.
UPSMAN Started	UPS service is started into the CS121. This event is always true, if the CS121 is running and therefore ideal for permanent recurrent jobs suitable like the forwarding of emails always after restart of the UPS or to produce log file entries steady.
UPS Connection Lost	UPS RS232 communication lost, CS121 tries to restore the connection.
UPS Connection Restored	UPS RS232 communication restored

Battery Low	The autonomy of the battery has reached the defined threshold "Battery Low". The UPS shutdown is pending. **ADVICE: The RCCMD shutdowns will be set into this event too, but without delay! (Emergency shutdown, if batteries are to weak)**
Output Breaker Open	Output breaker open. UPS is isolated from load. No supply of the consumers.
Output Breaker Closed	Output breaker closed. Load will be supplied.
Maintenance Breaker Closed	Maintenance breaker closed (active). Load will be supplied through the grid directly.
Maintenance Breaker Open	Maintenance breaker open (inactive). Load will be supplied via the UPS. Regular UPS protected operation.
Inverter Breaker Open	Inverter breaker open. Load is **not** UPS protected!
Inverter Breaker Closed	Inverter breaker closed. Load will be supplied via the inverter. Normal condition.
Battery Breaker Open	Battery breaker open. No battery buffering active!
Battery Breaker Closed	Battery breaker closed. OK, normal condition.
UPS Off	UPS off
UPS On	UPS on
New Alarm	New alarm, buzzer was activated.
Buzzer Off	Buzzer off
General Alarm	An alarm has occured. Alarm LED at the UPS is flashing.
General Alarm Off	No more alarm is active. Alarm LED at the UPS is off.
Overtemperature	Overtemperature of the UPS
Temperature Ok	Temperature of the UPS is back in normal range.
Output Bad	UPS output failure (e. g. voltage, frequency)
Output Okay	UPS output OK
Overload	UPS overload, reduce load otherwise the UPS shutdown is pending
No More Overload	No more overload
Bypass Bad	Bypass failure at input (e. g. voltage, frequency)
Bypass Ok	Bypass Ok
UPS Shutdown Canceled	UPS shutdown canceled
UPS Shutdown	UPS shutdown initiated
Charger Fault	Charger fault
Charger Ok	Charger Ok

System Off	UPS output will be switched off or rather is off
System Off Canceled	UPS output switching off canceled
Bypass On	Bypass on
Bypass Off	Bypass off
Battery Depleted	Battery depleted
Input Bad	Input bad, alarm will be triggered with the powerfail event
Mains Input Okay	Power restored at the input
Fan Failure	UPS fan failure
Fan Ok	UPS fan OK
Awaiting Power	Awaiting power prior of automatic start of UPS
Shutdown Pending	UPS shutdown/switching off is pending
Shutdown Imminent	UPS shutdown/switching off is imminent
Unit Powerfail	Powerfail at an UPS module
Unit Power Restored	Power restored at an UPS module
Redundancy Lost	UPS redundancy lost, load to high or UPS modules are not at hand
Inverter Failure	Inverter failure
Emergency Power Off	Emergency power off, UPS was switched off
Synchronization Error	Synchronization error between the parallel modules or for the feeding, e. g. power supply of a diesel generator
ECO Mode On	ECO mode on, load is on bypass
ECO Mode Off	ECO mode off, load is on rectifier
Battery Weak	Battery weak
Battery Need Replacement	Battery need replacement, please restart the UPS after replacement
Battery Ok	Battery Ok
Rectifer On	Rectifer on
Rectifer Off	Rectifer off
Inverter Off	Inverter off
Inverter On	Inverter on
Booster On	Voltage booster of battery is on
Booster Off	Voltage booster of battery is off
Battery Discharging	Battery discharging
Battery Charging	Battery charging
Load Is Supplied	Load is supplied, normal condition
Fuses Failure	Fuses failure

Fuses Ok	Fuses Ok
Battery Grounding Error	Battery grounding error
Generator On	Generator on
Generator Off	Generator off
Output Normal	Output normal, normal condition
Redundancy Ok	Redundancy is at hand
AUX Port 1 High	AUX port 1 opened
AUX Port 2 High	AUX port 2 opened
AUX Port 3 High	AUX port 3 opened
AUX Port 4 High	AUX port 4 opened
AUX Port 1 Low	AUX port 1 closed
AUX Port 2 Low	AUX port 2 closed
AUX Port 3 Low	AUX port 3 closed
AUX Port 4 Low	AUX port 4 closed



Schematic drawing of an UPS, e. g. NEWAVE

Yellow = Fuse

Blue = Automatic breaker

Green = Manual Breaker

H. Description of the alarms for single-phase UPS

Event	Description

Powerfail	UPS is on battery and the autonomy time decreases. **ADVICE: The RCCMD shutdowns will be set into this alarm, to send shutdown signals to the clients, if the powerfail will last longer!**
Power restored	Power supply restored
System Shutdown	This event is TRUE, if the remaining time is reached or rather undershot. That means the autonomy time is only available for seconds, the UPS shutdown is pending.
UPSMAN started	UPS service is started into the CS121. This event is always true, if the CS121 is running and therefore ideal for permanent recurrent jobs suitable like the forwarding of emails always after restart of the UPS or to produce log file entries steady.
UPS connection lost	UPS RS232 communication lost, CS121 tries to restore the connection.
UPS connection restored	UPS RS232 communication restored
UPS Battery Old	UPS batteries too old, call UPS service
Overload	UPS overload, reduce load otherwise the UPS shutdown is pending
Load Normal	No more overload
Overtemperature	Overtemperature of the UPS
Temperature Normal	Temperature of the UPS is back in normal range
Bypass on	Bypass on
Bypass off	Bypass off
Battery low	The autonomy of the battery has reached the defined threshold "Battery Low". The UPS shutdown is pending. **ADVICE: The RCCMD shutdowns will be set into this event too, but without delay! (Emergency shutdown, if batteries are to weak)**
UPS battery bad	Battery in bad condition
Scheduler Shutdown	This event got no relevance and will be removed in the future CS121 firmware
Input bad	Input bad, alarm will be triggered with the powerfail event
Load >80%	Load is over 80%
Load >90%	Load is over 90%
General Alarm	An alarm has occured. Alarm LED at the UPS is flashing
General Alarm canceled	No more alarm is active. Alarm LED at the UPS is off
Manual Bypass on	Manual Bypass on
Manual Bypass off	Manual Bypass off
Charger fault	Charger fault
AUX Port 1 High	AUX port 1 opened
AUX Port 2 High	AUX port 2 opened
AUX Port 3 High	AUX port 3 opened

AUX Port 4 High	AUX port 4 opened
AUX Port 1 Low	AUX port 1 closed
AUX Port 2 Low	AUX port 2 closed
AUX Port 3 Low	AUX port 3 closed
AUX Port 4 Low	AUX port 4 closed

I. Configuration of Microsoft SCOM 2007 as CS121 Trap Receiver (Monitor)

In this section we will configure Microsoft Operations Manager 2007 (SCOM/OpsMgr) as an SNMP Trap receiver, discover SNMP-enabled cs121 network devices, and configure an alert-generating SNMP-trap-based monitor to raise alerts when specific traps are received from cs121 devices.

Installation of the SNMP service (on Windows Server 2003)

- In the Control Panel, select Add Remove Programs
- Click on Add/Remove Windows Components
- Scroll down and select Management and Monitoring Tools, click Details.
- Click on the checkboxes for Simple Network Management Protocol (and optionally WMI SNMP Provider) and click OK.
- Click Next and click Finish.

Configuration of the SNMP service (on Windows Server 2003)

- Close Add or Remove Programs.
- Click Start, Run, type services.msc, and then click Enter.
- Scroll down and select SNMP Service. Right click the service and select Properties.

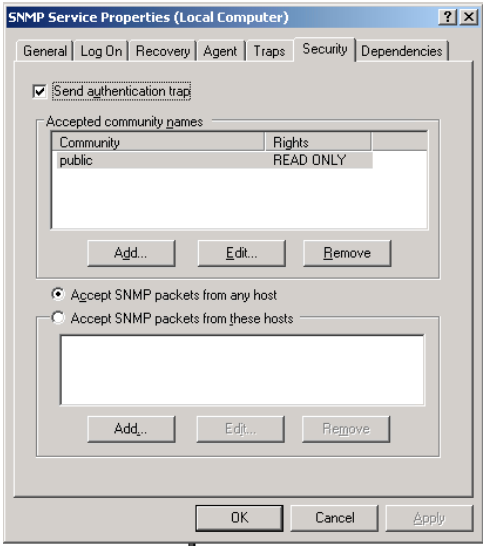


Figure 137: SNMP Service Properties

- Select the Security tab.

- Check the Send Authentication Traps checkbox. In the Accepted Community Names list, type “public” and click the Add to list button. Rights should be set to READ CREATE.
- Select the Accept SNMP packets from these hosts radio button. Use the add button to add the IP addresses of the managed devices that will forward SNMP traps to the OpsMgr server. Alternatively, you could select the Accept SNMP packets from any host option.
- Restart the SNMP Service.

IMPORTANT: SNMP community strings are case sensitive!

Activate the SNMP Trap Service (on Windows Server 2003)

- In the Services Panel, select the SNMP Trap Service
- In the SNMP Trap Service properties dialog select « Startup type : Automatic », then click the « Start » button to start this service now.

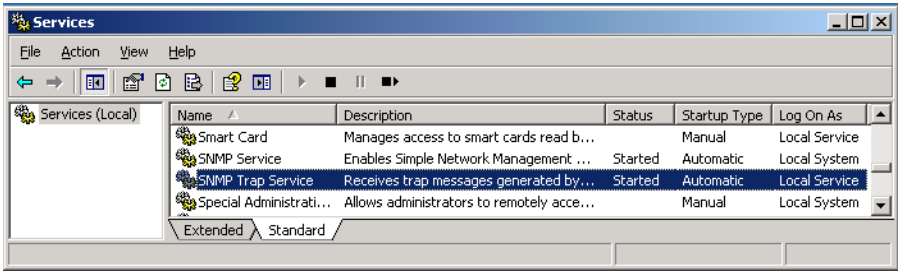


Figure 138: SNMP Trap Service

Configuration of OpsMgr as SNMP trap receiver

The cs121 device must be configured to accept SNMP requests from the OpsMgr Server. You must also configure the cs121 device to use the same SNMP community string you configured in the Accepted community names in the SNMP Service properties on your OpsMgr Server. Please take a look at the cs121 manual for the details of this configuration step...

Configuration of one or more alert-generating SNMP-trap-based Monitors

- In the Administration space, create a unsealed management pack to store your SNMP-based monitoring rules.

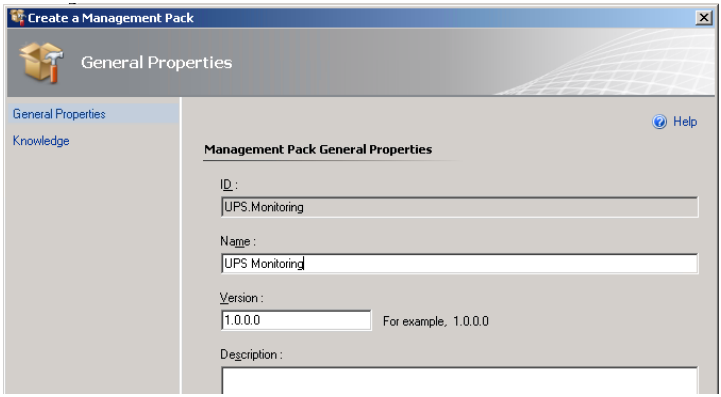


Figure 139: General Properties

- In the Operations console (Authoring space), start the Create a Monitor Wizard.
- On the Select a Monitor Type page, do the following:
- Expand SNMP → Trap Based Detection → Simple Trap Detection → Event Monitor – Single Event and Single Event.
- Select your unsealed management pack from the list. Click Next.

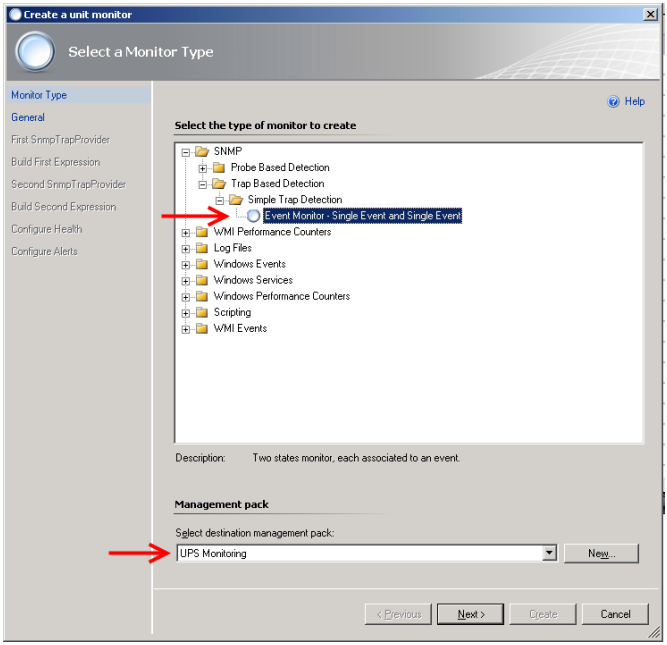


Figure 140: Select a Monitor Type

- On the General Properties page, do the following:
- Type the Monitor name, such as UPS On Battery Monitor. Optionally, type a Description for the monitor.
- Click Select, select View all targets, click a target, such as SNMP Network Device, and then click OK.
- Leave Monitor is enabled selected to have the monitor take affect at the completion of the wizard, or clear the check box to enable the monitor at a later time, and then click Next.

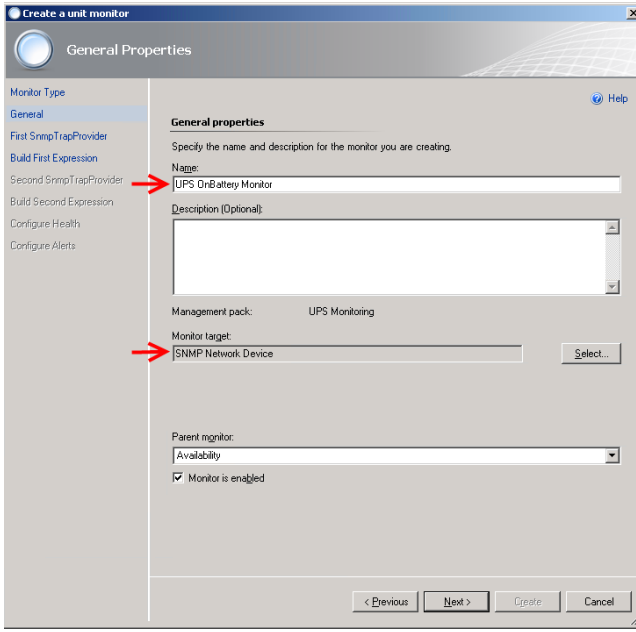


Figure 141: General Properties

- On the Configure the trap OIDs to collect page for the First SNMP TrapProvider, leave Use discovery community string selected.
- Click to place the cursor in the Object Identifier Properties section and type the first object identifier (OID) that you want to monitor: 1.3.6.1.2.1.33.2.3 (upsTrapAlarmEntryAdded). Then click Next.

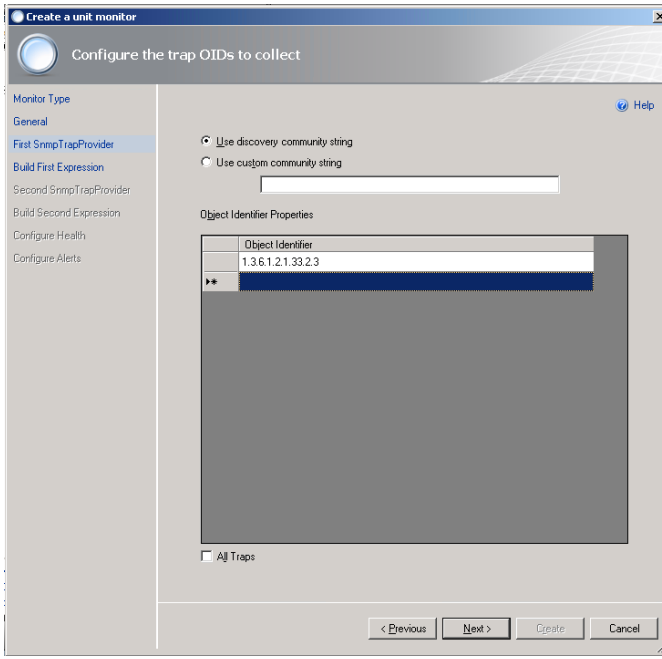


Figure 142: Configure the trap OIDs to collect

- On the Build Event Expression page, click to place the cursor in the Parameter Name section and type the trap parameter variable that you want to use here:
- /DataItem/SnmpVarBinds/SnmpVarBind[2]/Value
- Why did we use SnmpVarBind[2] in our expression? Because the traps second contains the OID of the traps UPS alarm (Object upsAlarmDescr of the trap).

- Click to place the cursor in the Operator section and select Equals.
- Click to place the cursor in the Value section and type the value to match here:
- 1.3.6.1.2.1.33.1.6.3.2 (The 1.3.6.1.2.1.33.1.6.3.2 is the well known alarm OID for upsAlarmOnBattery).

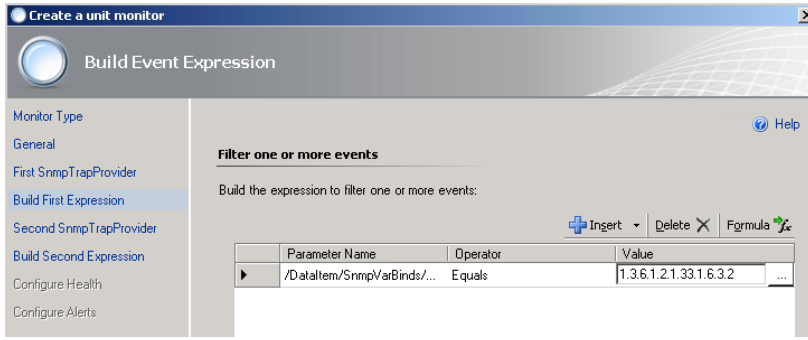


Figure 143: Build Event Expression

- Then click Next.
- On the Configure the trap OIDs to collect page for the Second SNMP TrapProvider, leave Use discovery community string selected.
- Click to place the cursor in the Object Identifier Properties section and type the first object identifier (OID) that you want to monitor: 1.3.6.1.2.1.33.2.4 (upsTrapAlarmEntryRemoved). Then click Next.

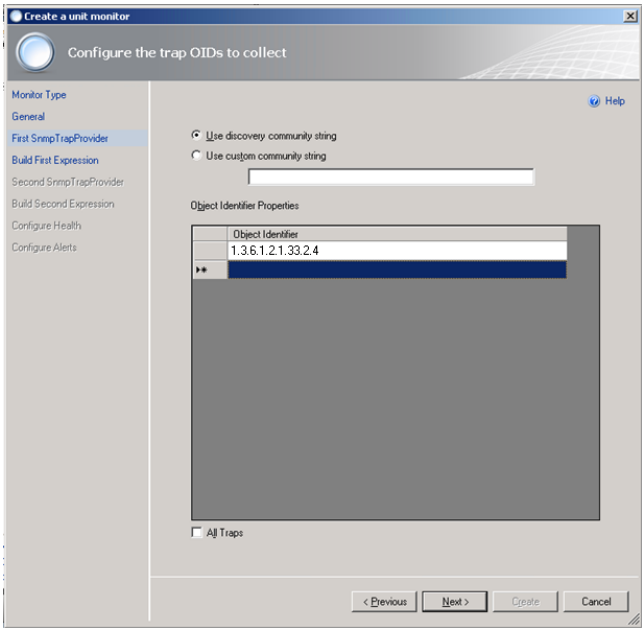


Figure 144: Configure the trap OIDs to collect

- On the Build Event Expression page, click to place the cursor in the Parameter Name section and type the trap parameter variable that you want to use here:
- /DataItem/SnmpVarBinds/SnmpVarBind[2]/Value
- Why did we use SnmpVarBind[2] in our expression? Because the traps second contains the OID of the traps UPS alarm (Object upsAlarmDescr of the trap).

- Click to place the cursor in the Operator section and select Equals.
- Click to place the cursor in the Value section and type the value to match here:
- 1.3.6.1.2.1.33.1.6.3.2 (The 1.3.6.1.2.1.33.1.6.3.2 is the well known alarm OID for upsAlarmOnBattery).

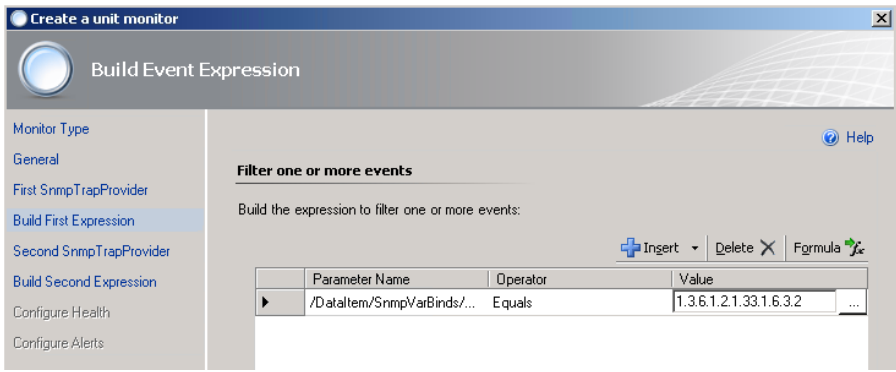


Figure 145: Build Event Expression

- Then click Next.
- On the Configure Health page, select Critical for the Health State of Monitor Condition First Event Raised. Then click Next.

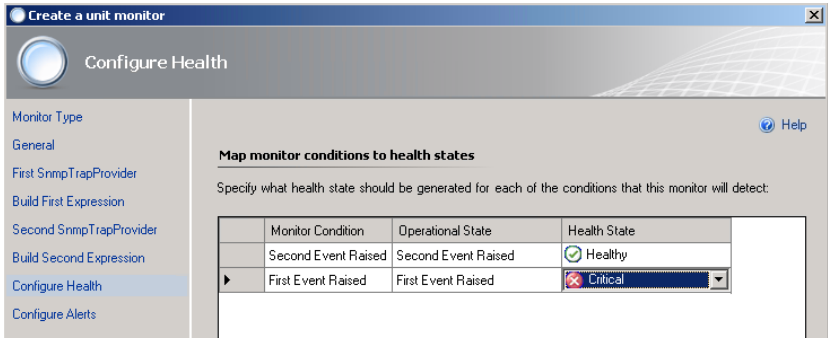


Figure 146: Configure Health

- On the Configure Alerts page, set the properties of the alert, for example:
- Type the Name for the alert, such as UPS OnBattery Alert.
- Optionally, type the Alert description. You can also click the (…) button and select Target and Data variables to include in the description, such as Device Name.
- Select a Priority from the list, such as High.
- Select a Severity from the list, such as Critical.
- Click Create

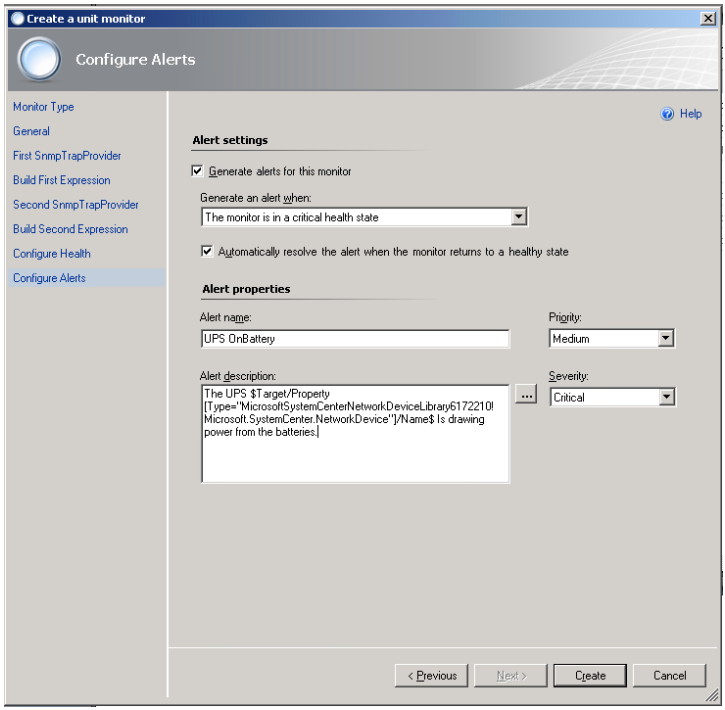


Figure 147: Configure Alerts

Discover your SNMP enabled CS121 devices in OpsMgr

- In the Administration space, right click and launch the Discovery Wizard.
- On the What would you like to manage page, select Network Devices. Then click Next.192.168
- On the Discovery Method page, enter the Start and End of the IP address range that you want to scan.
- Type the SNMP community of the objects that you want to manage.
- Select the Management Server that should receive the cs121 traps.
- Click Discover to display the Discovery Progress page.

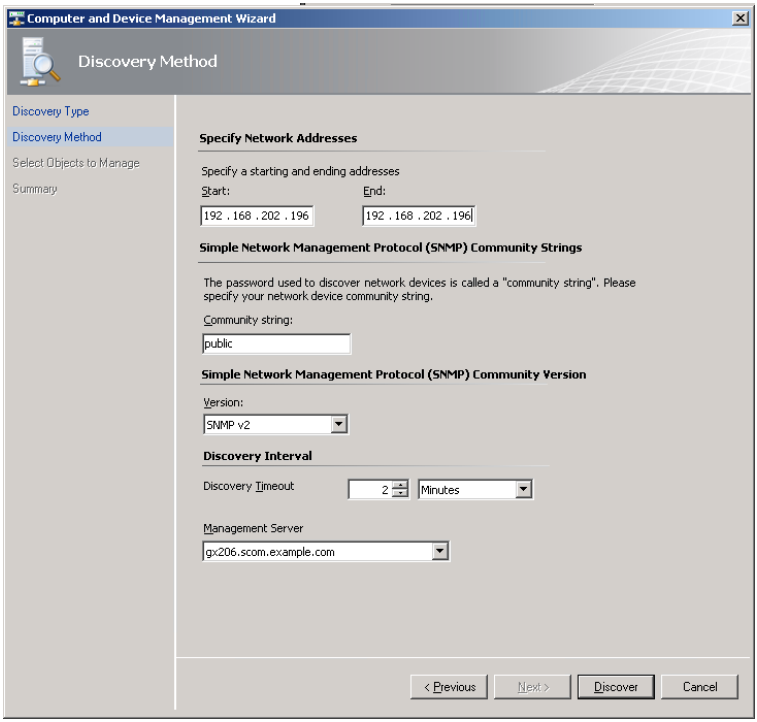


Figure 148: Discovery Method

Discovery for even a single device will run for a couple of minutes by default. If you specify an IP range, it will take a little longer.

- On the Select Objects to Manage page, select the devices desired for management.
- On the Summary page, click Finish. The objects will display in the Network Devices node of the Operations Console Administration space.

At this point, SNMP-enabled device availability monitoring will start automatically. Any traps (of kind upsAlarmOnBattery) received from the cs121 target devices will be raised as alerts in the Operations console.

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